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NUMBER 2

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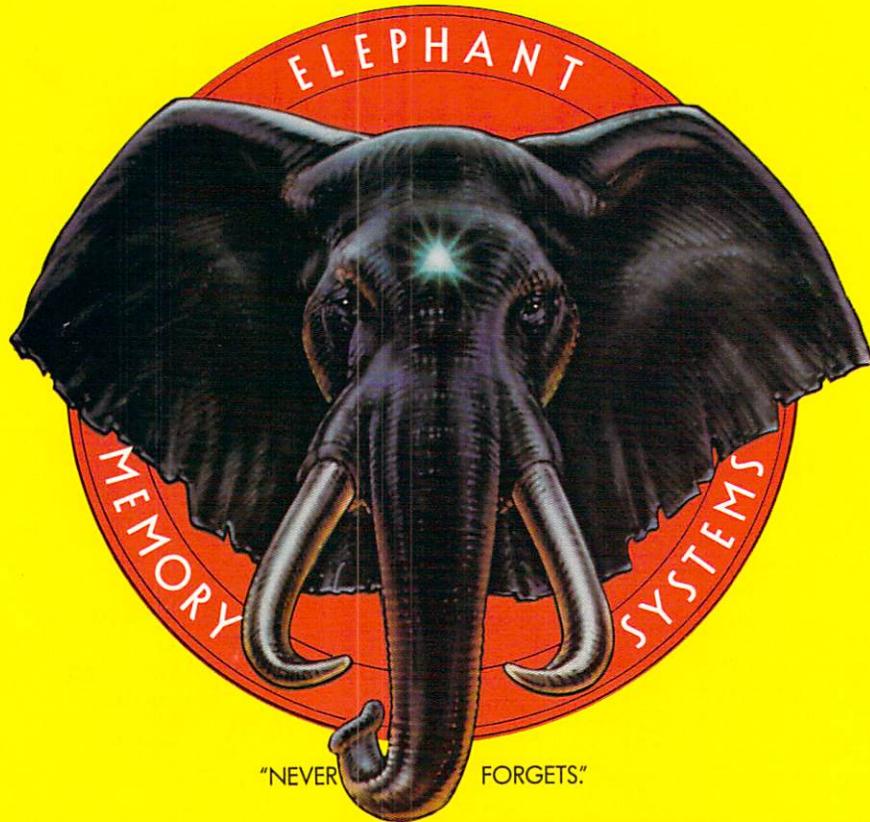
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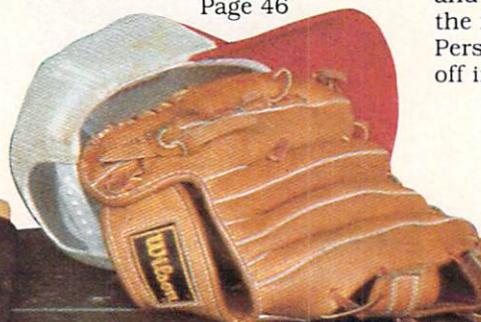
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COVER ILLUSTRATION
BY DANIEL MAFFIA

The sword, key, castle, treasure, and pirates in the cover illustration are recurring elements in adventure games.

SUPER

Its arcade games look and sound so real it seems an illusion to have them at home.

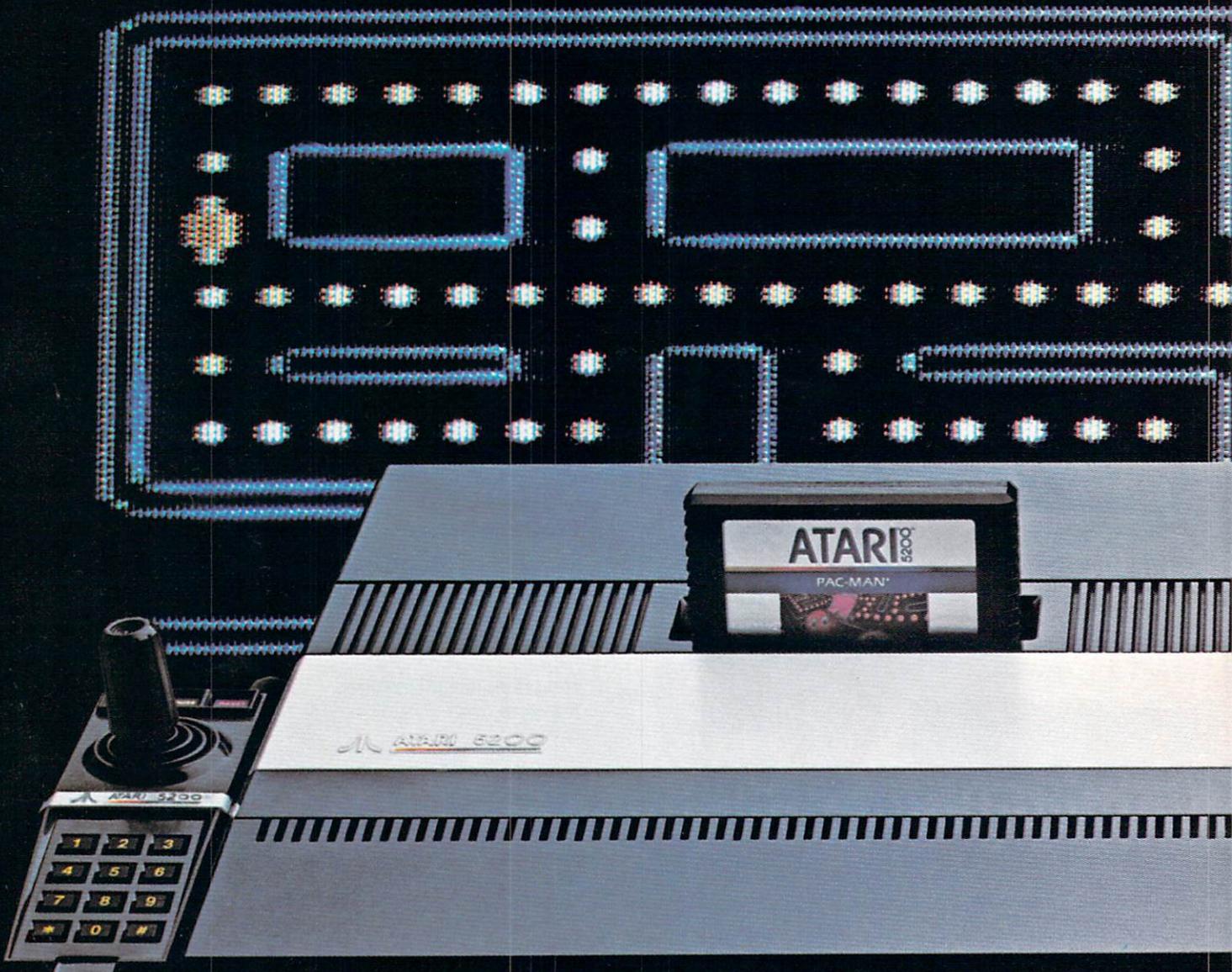
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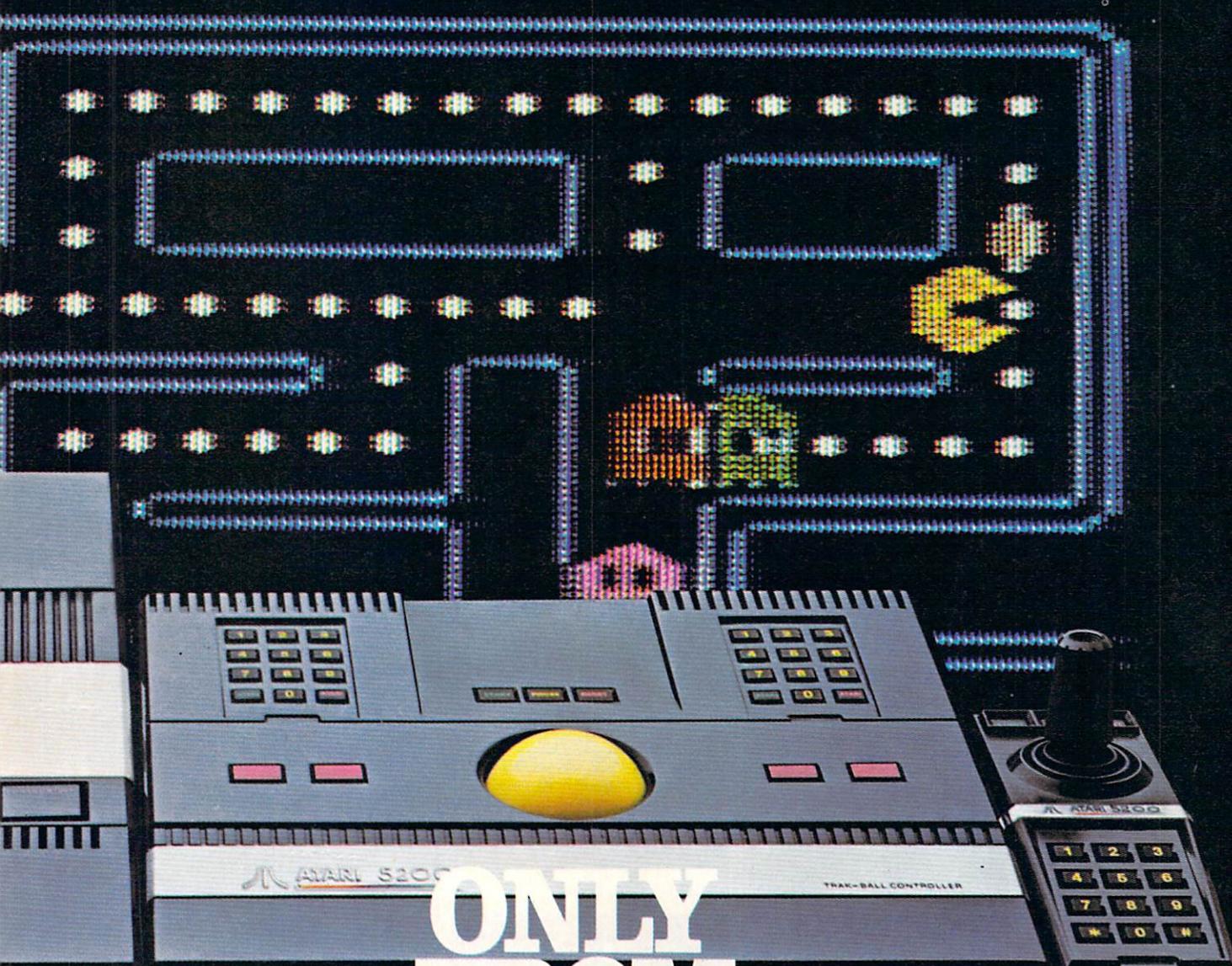
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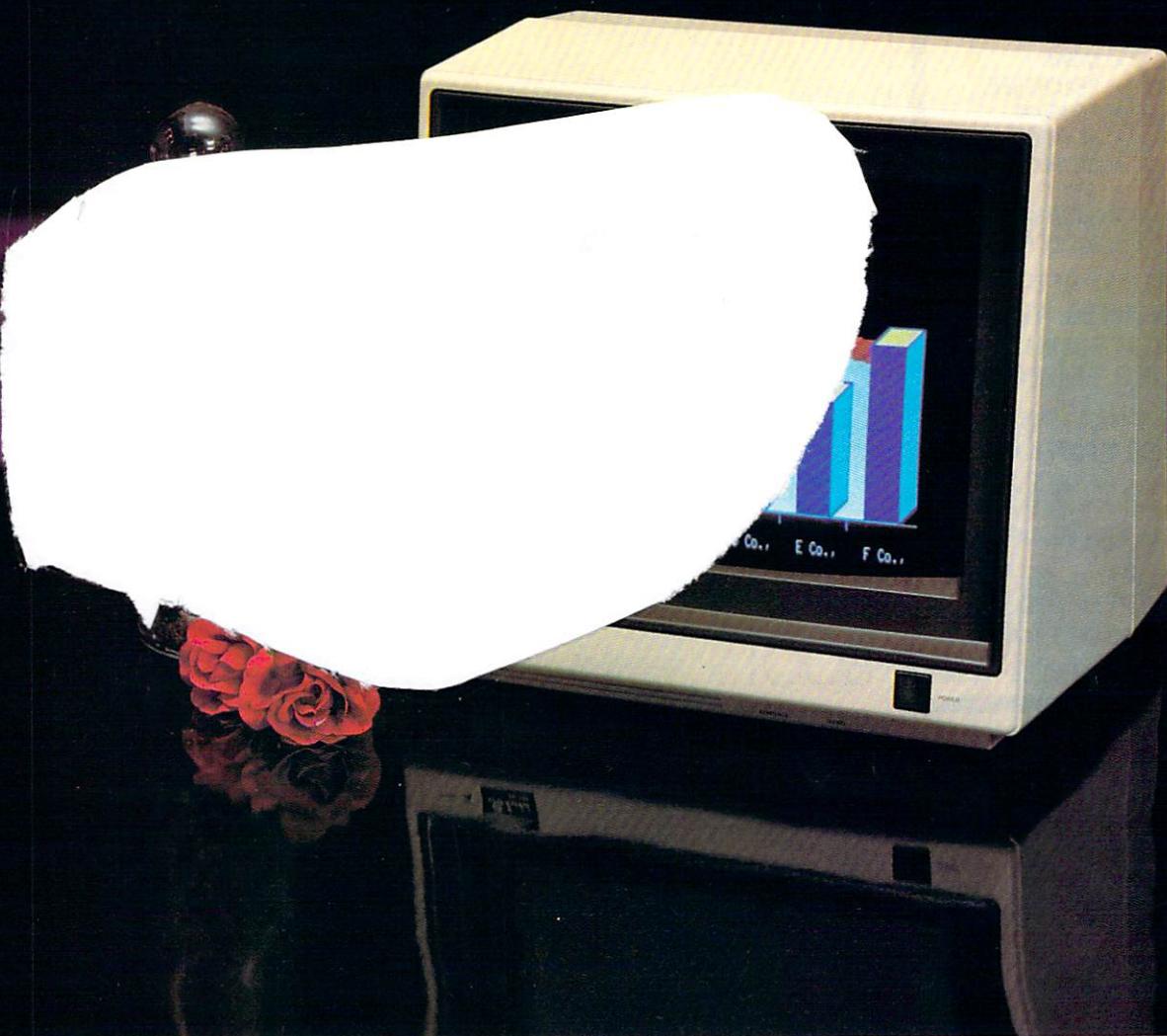
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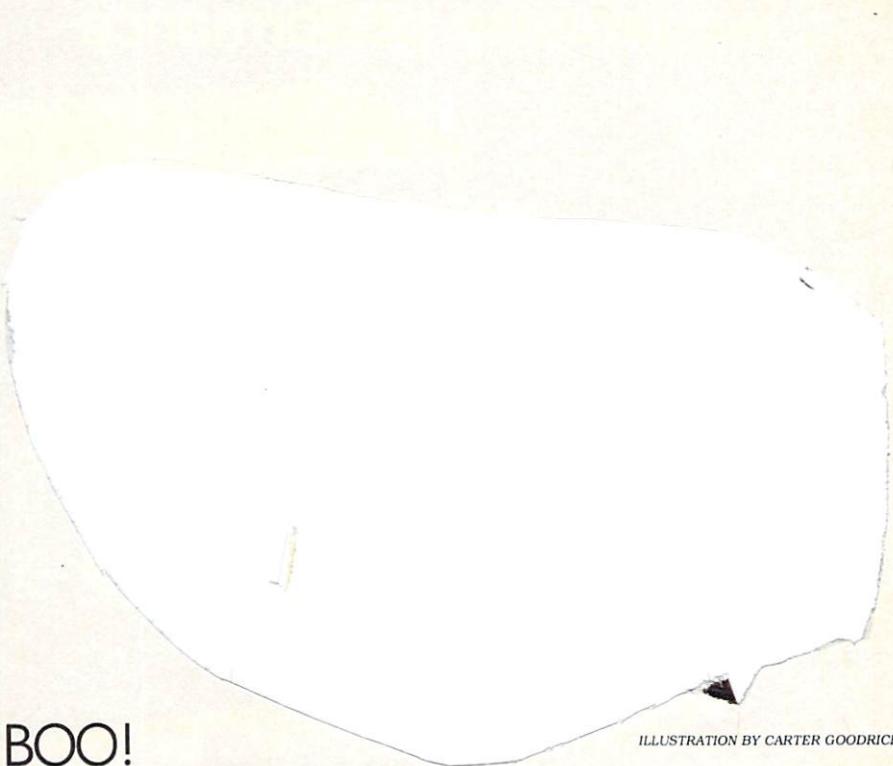
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EDITOR'S NOTE



BOO!

ILLUSTRATION BY CARTER GOODRICH

THE BOGEY MEN OF COMPUTING KNOW HOW TO GET YOU

The world would be a pretty dull place without fantasies and dreams. But when our wishes are really unreal expectations, there is hope for little beyond disappointment. That's the way it is for all too many computer owners.

I can't bear to hear any more stories of the people who buy a computer and wait for miracles to happen. Visions of them come to mind—there they sit willing their computers to perform: Skip steps. Go faster. Do better. There are so many promises of what a computer can do that it's hard to avoid the trap. It doesn't take very long as a computer owner to realize that the things that most excite us about it can also lead us down the path to failure.

Our own unreal expectations of instant success—without effort or understanding—become the bogeymen that scare us away. Not everyone can resist them.

Success with a computer starts with the realization that you are embarking upon an educational process. The people who realize that seldom fail. The opportunity to achieve a new kind of learning is the real promise. To do so, though, requires

commitment. Remember the commitment it took to learn to swim or to ride a bike or to play bridge or to speak French. Those who knew that a commitment was required and who made it, almost as if they were setting out on a new adventure, learned. The same is true with computers.

This issue of FAMILY COMPUTING is rich in examples of reaping real rewards through a commitment to learning with and about computers and computing. It's full of stories about struggles and frustrations and sticking with it and success. And I think we've got some experiences for you that are just plain fun.

To learn to use a computer is to acquire a life-long skill. Don't be tricked by unreal dreams of instant miracles. Give your computer a chance to be the real treat it can be.



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Apple*, Commodore*, Timex/Sinclair* . . .

by William B. Sanders



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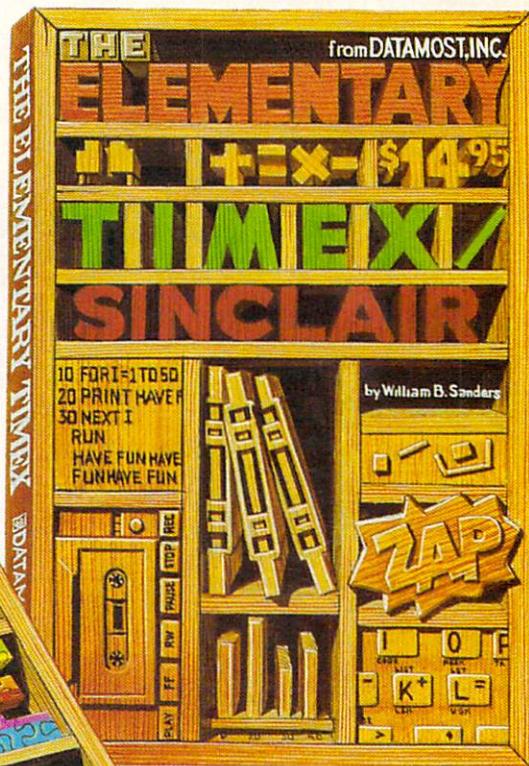
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The idea of getting your own computer sounded wonderful. But now that you have it you're a little scared . . . you think it sounds so technical. Well, take heart. Relax. Help is here. William B. Sanders has written individual books about the Apple, the Commodore 64, and the Timex/Sinclair computers. When you select the one which matches your computer you can breathe easy because it'll be like having your all-time favorite teacher at your side . . . gently guiding you, explaining, and showing.

THE ELEMENTARY series sweeps away the



confusion and explains your Apple, Commodore 64 or Timex/Sinclair in down to earth terms, coupled with enjoyable cartoons. It shows you how to hook it up, how to use the keyboard and work on the screen—all the unique things your computer can do so you can make use of it right away! And it also answers those questions you'll have about how to write your own simple programs, about graphics, utility programs, and various hardware options.

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BEHIND THE SCREENS

PEOPLE, NEWS, AND TRENDS

EDITED BY JOHN WALLACE

Spreading Words Through the Source

Writing can be a lonely and laborious craft, as many novelists will attest. Burke Campbell, a Canadian writer, has found a computerized alternative to the traditional publishing process. Last November, he used an Apple III to write and edit a 20,000-word novel, *The Blind Pharaoh*, which he then transmitted onto the information network, *The Source*, where subscribers can enjoy it to this day.

Campbell did it all in one three-day sitting, dramatically attired in a black sequinned track suit, seated on the stage of a crowded Toronto art gallery. There are other novels on *The Source*, but none of them were computer-processed from the very first draft, as Campbell's was.

It's hard to say exactly how many readers have plugged into his novel. With the going rate for *Source* use presently at \$20.75 an hour between 7 a.m. and 6 p.m. (EST) and \$7.75 thereafter, most people will probably be sticking with the tried-and-true, and substantially cheaper, paperback.

Source subscribers who want to transmit their writing "on-line" can contact the company's User Publicity Department. Payment ranges from nine to 17 percent of gross receipts from billable usage.



PHOTOGRAPH BY JAKE PETERS

The author at work: His 20,000-word novel was composed entirely on the computer and transmitted directly to *The Source*.

Milk Shake Insurance



"No, we're all okay, but our computer's gone," reads the caption of this alarming advertisement. It may represent typical insurance-industry scare-sell, but the ad nevertheless addresses a valid concern touching more and more people throughout the country. Columbia National General Agency, an insurance firm in Columbus, Ohio, offers "Safeware," insurance for microcomputer owners who use their equipment for business purposes.

"A lot of families really do have significant systems—computers that are as valuable to them as their cars," says Dave Johnston, an independent data-processing consultant who originated the policy two years ago.

Johnston had purchased an Atari 800 initially to play games with his kids. He soon turned to authoring his own games and found that, as a business tax write-off, his computer was no longer covered under his homeowner's insurance. So he invented his own coverage.

For as little as \$35 annually, the microcomputer owner can get up to \$2,000 worth of protection. Johnston said that "tens of thousands" of people using their computers for home-business purposes have taken out some form of coverage. Writers who do word processing on their computers constitute a large percentage of those covered—now they are safe for everything from the disk drive suffering from periodic power surges, to system theft or fire dam-

age. "We cover water damage, too," says Johnston. "Home plumbing is not always that reliable, and many people keep their computers in the basement."

What about the inadvertent milk shake spill? Cola in the keyboard? "I hesitate to mention it," says Johnston. "We even cover that, as 'accidental damage.'" He added, "But I do hate the thought of a lot of little ones let loose with peanut butter near the computer."

Electronic Room Service

Travelers and tourists who've grown accustomed to the familiar furnishings of a hotel room—color TV, flowered bedspreads, and city guidebooks—are about to encounter a new kind of "room service."

Since April, 100 rooms at Chicago's Midland Hotel have been outfitted by a company called Travelhost with computer terminals that hook up to the rooms' TV sets. The company also plans to install modems—devices that would allow guests to hook up to their own systems at home or at work.

Using the terminals, guests can look over computerized entertainment and dining guides, local employment opportunities, airline timetables, stock reports, and UPI news wires. The user simply enters a credit card number, and for an initial \$3 fee, plus a subsequent per minute charge, the guest no longer has to feel so out of touch.

So far, the venture has garnered favorable reviews but no special requests for the Midland's computer-outfitted rooms. Nevertheless, Travelhost is proceeding optimistically, working out arrangements with Quality Inn, Sheraton, and Hilton hotel chains, among others. The company has contracted to wire 15,000 rooms, and anticipates installing 100,000 terminals by the end of the year.

The only real snag so far is that some guests have been swiping the pocket-size attachments. Midland's Assistant Manager Donna Shaw says, "People think that they're getting a switch to convert their TV

WHILE OTHER COMPUTER COMPANIES ARE BUSY SETTING NEW PRICES, SPECTRAVIDEO IS BUSY SETTING NEW STANDARDS.

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While price wars and confusion reign all around us, Spectravideo goes about its business, setting standards by which all other personal computers will soon be judged. MSX and LOGO are the two latest examples of how Spectravideo is rocking—and reshaping—the personal computer industry.

MSX AND LOGO.

It is now history that, on June 15 1983, Spectravideo, Inc. joined with most of Japan's largest electronics firms to launch MSX: The most far-reaching personal computer standard in history. MSX is the name given to a specific hardware/software configuration that makes product interchangeability possible. While Spectravideo is proud to participate in MSX, we are even prouder of this fact: It was our own SV-318 computer that was used as a prototype for the MSX design! There are two important aspects to this.

First, all future MSX hardware—i.e. computers, peripherals, appliances—will be based on several key design elements of the SV-318. What does this mean to you, the consumer? A great deal, because when you buy an SV-318, you will not only be able to use all of Spectravideo's own software and hardware—you'll also be able to take advantage of all the remarkable new equipment that will be coming from other MSX participants.

In addition, the software aspect of MSX was largely inspired by the software built into the SV-318. From the outset, Spectravideo offered built-in Microsoft BASIC as its resident interpreter. Now, Microsoft also makes a LOGO program compatible with the SV-318. It was Spectravideo's Microsoft BASIC/LOGO that helped to make MSX possible.

Another standard that Spectravideo can take credit for is the built-in Joystick/Cursor Control. Built right into the SV console, this control is always at fingertips and is much easier and faster to use than external joysticks or conventional editing controls.



compatible software standard

Certain engineering elements that helped to make this built-in control possible have also been incorporated into MSX.

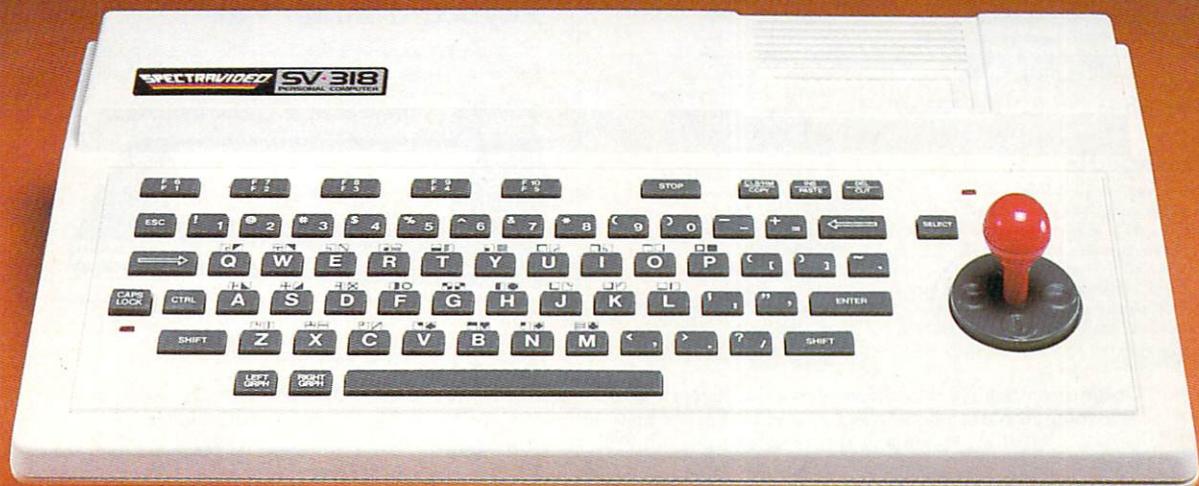
OTHER STANDARDS OF EXCELLENCE.

While these are the computer standardizations that Spectravideo helped to initiate, they by no means represent the whole SV-318 story. This remarkable computer has also established many standards of excellence that other personal computers now aspire to:

- **Built-In Super Extended Microsoft BASIC**—Makes the SV-318 the first truly programmable affordable computer!
- **Extraordinary Memory**—32K ROM expandable to 96K, and 32K RAM expandable (via bank switching) to an amazing 256K.
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- **More Available Software**—Built-in CP/M compatibility gives you immediate access to over 3000 existing software programs. Plus, you can utilize Spectravideo's own fine software library.
- **Advanced Graphics Capabilities**—The SV-318 offers 16 colors in high resolution, and more importantly, 32 programmable sprites that allow tremendous control of movable screen objects.
- **Many other fine features**—Such as Z80A Microprocessor with fast (3.6) internal clock, top-loading cartridge slot, 10 user-programmable special function keys, 3 sound channels (8 octaves per channel!), low profile and attractive styling.

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Fifteen months ago Memotech developed the first 64K Memopak, designed to maximise the capabilities of the Sinclair ZX81. Since then, using the ZX81 as a starting point, we've gone on to produce a comprehensive range of Memopaks, adding 16K and 32K memory expansions, utilities packages comprising a Word Processor, Z80 Assembler and Spreadsheet Analysis, plus Communication Interfaces, High Resolution Graphics and a professional quality Keyboard.

To complete our range of Timex add-ons, we are now introducing the MEMOPAK RS232 Serial Interface.

RS232 Interface

The RS232 is an all-purpose interface which allows the Timex not only to output to suitable serial printers, but can link up with numerous types of peripheral or even other processors. The Interface has two main modes of operation: BASIC mode allows you to use the range of functions supplied in the RS232 EPROM within an ordinary BASIC program, and TERMINAL mode allows you to use your Timex as a terminal to another processor. The EPROM functions offered permit the user to send, receive and convert bytes between Z80 code and ASCII, as well as check the status of numerous control flags. Received or transmitted data can appear simultaneously on the screen, and received data may be printed simultaneously.

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The Assembler allows you first to code and edit a source program in the Z80 language, and then assemble it into machine code. You can now write flexible and economic programs. The Editor mode allows you to code directly in the right format, manipulate individual lines and control the exact placing of source and machine code. Routines may be merged or listed (even to a commercial printer using our Centronics Interface). The assembler mode handles all standard Z80 mnemonics, numbers in hex or decimal, comments and user-selected labels.

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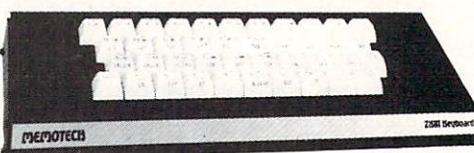
Memotech Keyboard

The Memotech plug-in Keyboard plus buffer pack takes the effort out of data entry for Timex users. The Keyboard has a light professional touch and is housed in an elegant aluminum case. The simple plug-in system means that you are not obliged to open up your Timex, use a soldering iron or invalidate your Timex warranty.

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sets to cable." Soap, towel, and drinking glass pilfering has always been the innkeeper's lament. Computer revolutions notwithstanding, it seems that some things never change.

Sugar and Spice and Software That's Nice



You know the names—*Space Raiders*, *Astroblitz*, *Demon Attack*. And you know the games—exotic shoot-'em-ups in which you shoot down, blow up, or otherwise blast off the face of the earth one or more nasty aggressors—mutant aliens, enemy bases, invading space ships. Well, Elizabeth Stott, and her friend, Lucy Ewell, mothers of three sons and two daughters, respectively, wanted an alternative. So they set out to create a line of nonviolent text adventures "for girls." The series, named Rhianne Software, is intended to "invite creativity, exploration, and reverence for life," and is designed so that "sensitive boys will enjoy them, too."

In one game, *Jenny of the Prairie*, it's your task to help a pioneer girl gather food and other provisions from the wilds. In another, *Cave Girl Clair*, you are supposed to help the little prehistoric heroine tend fire and collect medicinal plants.

"We noticed that boys were getting into computers and girls weren't," Stott said. "Games are all directed subtly towards boys." Because games are usually kids' first encounters with computers, Stott and Ewell wanted to design computer activities that would appeal to girls. "Ease with computers will be essential for girls, too."

"We're not saying that girls should all be wimpy. They can be competitive and active, too. But these games are more congruent with the way women have been socialized to think and operate in the world."

It's generally accepted that girls

don't take to blast-'em-away arcade games and the arcade game environment as much as boys do. As a result, girls often miss out on this important first exposure to computers. It's another question, however, whether or not Ewell, Stott, and their Rhianne series of "softer" software will remedy the imbalance.

Whiz Biz Kid

Kim Cohan was only 13 when he got his first personal computer. It was one of those Heathkit models—the build-it-yourself kind. "I kept bugging my mom for one," he explains. "In order for it to be as cheap as possible, I figured I could put one together myself. My folks owned a TV station, so I was always around technology. I guess I just naturally gravitated that way." Evidently so. Now, at 19, Kim's the president and founder of Micro Timesharing, a company that leases coin-operated computers to libraries in California, and also manufactures and distributes the interface cards required to convert micros to coin-op.

Cohan began his concern during his first year of college. He had installed a coin-operated computer in a local library in Malvern, Arkansas, and met with such success that he left school and returned to Salinas, where he hocked his furniture to purchase three more units. A more sophisticated capital-raising campaign allowed him to purchase the rest of his present line of 12.

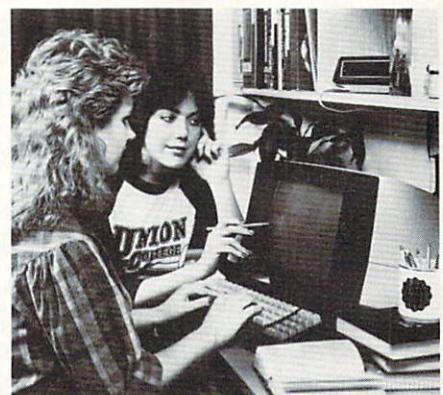
Cohan's Apple II plusses and Franklin Aces rent for \$3 an hour. According to George Miller, the librarian in charge of the program at the San Francisco Public Library, "Most people who come in use it for games and word processing almost entirely. A very small percentage have used the spreadsheet program that we have in-house."

The interface cards manufactured by Cohan's firm allow libraries to convert their own personal computers to coin-op, thereby keeping the machines' revenue for themselves.

"Typically, coin-op computers are being used by people who can't afford them otherwise, or by people who want to learn a little bit more about them," Cohan says. In his family, such exposure was part of everyday life. With coin-op computers in their community, though, more people might be able to say, "I just gravitated that way."

Bryte College Years

It has been said that you never lose the friends you make in college. Since the beginning of September, students at Union College in Lincoln, Nebraska, have had a new kind of friend and roommate. It's a computer terminal installed in each of the school's 400 dorm rooms. Says Tom Becker, director of Union's computer services department, "We feel that students should be as comfortable on the computer as they are on the telephone."



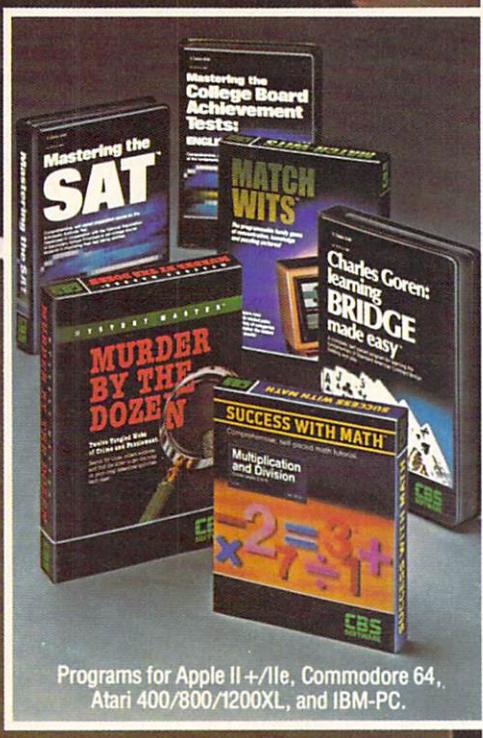
College years will be brighter starting this fall, as students will be able to word process, program, and access the library's card catalog, a computerized bulletin board, and a lost and found. In addition, students will be required to pass a computer-literacy test in order to graduate. Gary Dickerson, a senior studying computer science at Union, reports that while "most students didn't really see a need for them at first, and a lot of people weren't that thrilled, once they start to use the computers they'll really learn how to take advantage of them."

He believes that the students who stand to gain most are people like a friend of his "who really wasn't into computers until he heard of them by word-of-mouth." A trip to the computer terminal room last year and conversations with the computer buffs there convinced him of the machine's potential. "Now he does everything on it—term papers, essays, even letters."

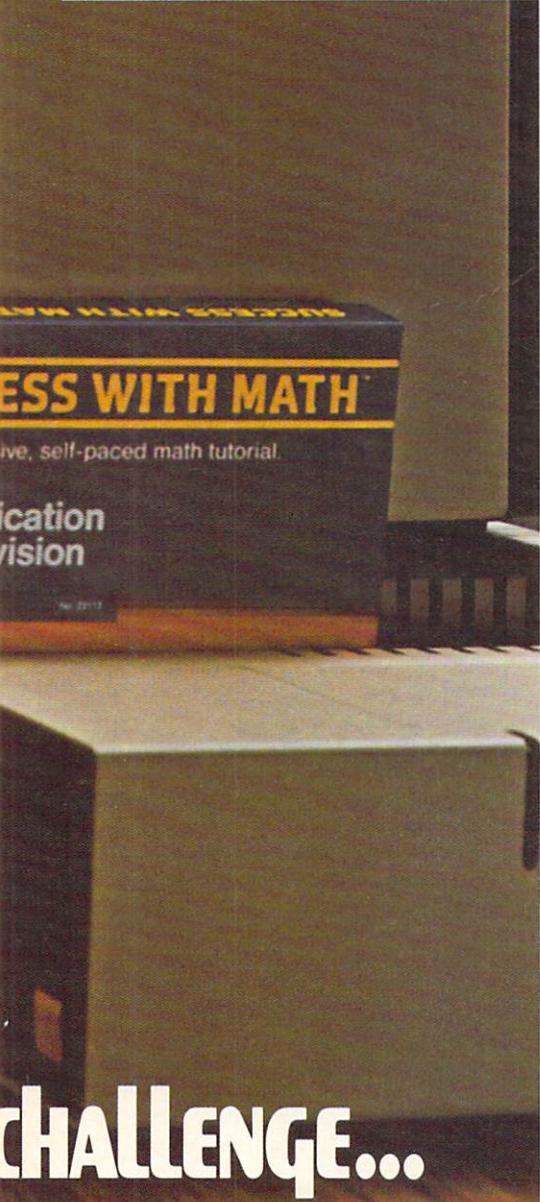
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These programs are only the beginning of how we plan to tickle your fancy. CBS Software is preparing lots more for you and your family, including exciting new learning programs created in partnership with Children's Computer Workshop (an activity of Children's Television Workshop, the folks who bring you *Sesame Street*, *The Electric Company*, *3-2-1 Contact* and a host of other entertaining products for children).

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HOME BUSINESS

COMMUTING WITH COMPUTERS

One Solution to Overdoing Overtime at the Office

BY CHARLES GAJEWAY

You may have seen the new sight on trains and planes—snug portable computers slipping into briefcases, computers that look like briefcases, or standard-size computers paraded about in padded vinyl carrying cases. It's the sequel to the calculator craze of a decade ago. A growing number of professionals are transporting computers between work and home, or buying computers that stay at home. The idea, of course, is that these computers will give people the flexibility to work on their own time. It's a valid idea, but a hard one to pull off. I've been commuting with, or between, computers for three years now, and it's taken that long to perfect the trick.

As a financial analyst for the corporate budgeting department of Merrill Lynch in New York City, my work involves hours of painstaking calculations, revisions, and typing. Ten-to 12-hour days are par for the course. Three years ago, it seemed like I was spending my whole life at the office. Today, I have two computers at work and two at home. Having two workstations hasn't necessarily reduced the work load, but it's allowed me to curtail late nights at the office and spend more time with my wife, daughter (age six), and son (age two).

This alluring lifestyle change has bred some problems of its own. Because of my fascination with the power of computers, I've had to fight (and win) a battle against computer addiction, wearing my wife's patience threadbare. And before I bought a computer for my home, I wore myself thin carrying one back and forth on a rolling torture chamber known as the Long Island Railroad. But that's all in the past. I've finally achieved some balance be-

CHARLES GAJEWAY, who lives in Lake Grove, New York, is a senior financial analyst in the corporate budgeting department of Merrill Lynch & Co. He teaches personal computer seminars at the New School for Social Research and at Future Information Systems' Learning Center, and is currently working on a book about popular software.



ILLUSTRATIONS BY GIL EISNER

tween life at work and life at home.

Everything started simply enough, with a lunchtime amble into a computer store. The salesman asked what I did. When I told him, he showed me VisiCalc, the classic electronic spreadsheet program that has sold more personal computers than anything else. It sold me—on the *idea* of a computer, at least. I was spending 10 to 12 hours a day doing spreadsheet work (figuring long-term cost projections) by hand, struggling against deadlines. I went back to the office and asked my boss about getting a computer.

SPEED AND POWER

He was very receptive. Two weeks later, I stood in my office, surrounded by a pile of empty boxes, looking at a new Apple II plus system. That evening, I read the Apple and Visi-Calc manuals on the train commute home. Over dinner, I enthusiastically described the new computer to my wife. She was skeptical, but patient.

Between a reading of the manuals and my programming experience, (time-sharing on a mainframe), I was able to get off to a quick start the next day. By lunchtime, I had put together an analysis of my latest project. Normally, it would have taken two days to prepare it by hand and get it typed; this time, after only

three hours, the answers were streaming off the printer. Gleefully, I tore off the report and took it in to my boss. He was surprised and pleased to get it so early, and even more so when I incorporated his suggested changes into the report, printed a fresh copy, and had it back in his hands less than 15 minutes later. My first day with my Apple had gone well.

I was so thrilled with the Apple's power that I immediately sought new ways to use it. But as I began to do more and more with the versatile machine, a strange thing happened. Although I was getting work done faster, I wasn't spending any less time at the office. Instead, more projects were sent to me because I could turn them around faster. The very thing that was supposed to lighten my work load had actually increased it!

One night, during a weary train ride after work, I had the notion of taking the Apple home. I thought it would be preferable to do overtime work at home; at least my family would know I was still alive. So I bought a carrying case and turned the Apple into a commuter. Carrying it on the Long Island Railroad and the New York City subways was a bit awkward, but having the Apple home was well worth any mass-trans-

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HOME BUSINESS

sit aggravation. I worked in the dining room, and my wife and I played computer games in the evening. She was delighted; she had been spending a lot of evenings alone.

But after several expeditions lug-
ging the computer and two disk
drives back and forth, setting them
up and taking them apart, I began
to think about buying a computer
for my home.

WAXING ADDICTION

It appeared to be a very attractive idea. By then, in early 1981, I had an extensive collection of games as well as business software. With good home and educational programs coming onto the market, I could easily envision a home version of my office system being a powerful, useful addition to my professional life, as well as a real family resource. In retrospect, I see that the early stages of addiction were setting in; I was becoming a personal-computer junkie!

I knew of several people in the company who had been given systems to use at home, so I talked the idea over with my boss. He didn't say no, but he didn't say yes, either. I discussed it with my wife, too. She wanted to see me home more often, and she liked having the machine for games, but it was too large an investment to make lightly. Then a miracle—I entered a raffle at an Applefest fair several months later and won an Apple. I took it home. I was overjoyed, my wife was withholding judgment, and Apple users at the office were envious.

At first, the new machine was a roaring success, not so much because I got more done, but because I could balance my life more effectively. Instead of working heavy overtime at the office, I'd reach a stopping point, save my work on a floppy disk, and take it home. After playing with my daughter and son, and having dinner at a normal hour, I'd pull out VisiCalc or a word-processing program and do some work at ease in my dining room. Then, I'd go to bed early with my work done.

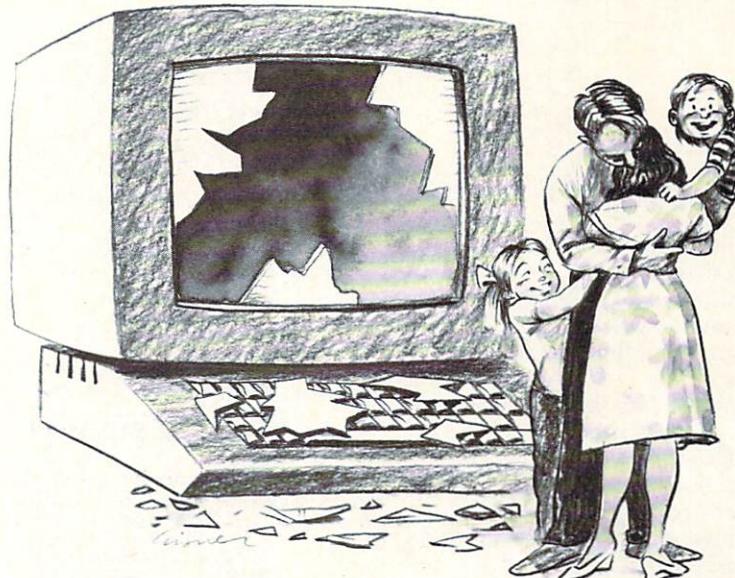
Throughout the rest of 1981, computers began absorbing a great deal of my attention. I was always looking for new ways to expand my use of the equipment. I also read constantly.

But I wasn't working toward any specific goals. I was merely absorbing obscure facts about neat things the Apple could do. My poor wife became a classic computer widow, to-

tally uninvolved with, and increasingly resentful of, my latest obsession. By early 1982, she tired of listening to computer talk and of seeing equipment and wires strewn around the dining room. She objected to the situation, loud and clear.

Then my boss urged me to "get away from the machine" and renew

tant to start using it. Most of the early programs for the PC were simply translations of Apple packages that had no real advantage on the IBM. A year ago, however, I had the opportunity to participate in the testing of a major piece of software for the IBM PC, 1-2-3 from Lotus Development Corporation. The soft-



some of the contacts with clients and friends that had faded somewhat in my fervor. Dazed and confused (I mean, I was doing useful things, right?), I stepped back and evaluated the situation.

WANING ADDICTION

I didn't want to give the computers up, but I was clearly headed down the wrong road. To better integrate the Apple into family life, I bought a desk for my machine at home. That way, I could have the computer handy, but unobtrusively housed. I made an effort to become human again. I cut back on my game-playing and programming efforts, and reduced computer-related conversations to a bare minimum. I relegated my beloved Apple at home to the status of a power tool—something put away until needed.

It was harder at the office. Frequently, people were referred to me for answers to software questions and advice on setting up systems. Much of my work, of course, required the Apple. Still, I made an effort to focus my activities, concentrating only on immediately productive tasks. All aimless experiments and evaluations were cut out.

But then, another twist. My office got an IBM PC. At first, I was reluc-

ware—a combination of spreadsheet, word processing, and data-base management—had several advantages for our office, and I gladly got involved.

Soon enough, I wanted to be able to use 1-2-3 at home for the same reasons I had wanted to use VisiCalc. But under my new philosophy, I found it hard to justify two home systems, both to my boss and to my wife. My dilemma was solved when I was asked to evaluate the Compaq portable computer for my company.

This system, with a double disk drive and a built-in monitor, is fully compatible with IBM software, and folds into a 28-pound package that's the size and shape of a sewing machine. I can store it in a closet at home, ready for use in minutes, or carry it to the office if necessary.

My work situation is now very flexible, my computer mania is under control, and my family's attitude toward computers is more open-minded. My wife, who for a long time didn't want to talk about or touch the Apple, now uses it for games and setting up filing systems. My two-year-old son has yet to express any interest, but my six-year-old daughter is taking computer courses at a local learning center. Best of all, Dad's come home again. ■

HOME-SCHOOL CONNECTION

COMPUTERS IN THE CLASSROOM What Parents Should Know

BY DANA RUBIN AND BOBBY GOODSON

Lucy Chiu stared at her daughter in disbelief. Six-year-old Sally had just described the new robot in her kindergarten class.

Chiu marched right over to Montclaire Elementary School in Cupertino, California, to find out what was going on.

Sure enough, she learned that the class was using a robot—a three-and-a-half-foot tall, 33-pound electronic machine that operates on student-generated commands. Now, Chiu admits, nothing her daughter says surprises her.

Like Chiu, parents everywhere are listening more closely than ever to what their children say about what's going on at school, and often they're surprised. Many of these parents are concluding that in order to keep up with their kids, they've got to gain some computer savvy of their own—however unfamiliar or threatening that thought may be. Even in California's Silicon Valley, where computers are commonplace in homes, parents are not always sure of how they're used at school. Because of that confusion, parents today are bringing up new topics—and doubts—at the traditional parent-teacher conference. The subjects they want to discuss range from how the computer is being used to how they can best contribute to their children's computer education.

QUESTIONS AND ANSWERS

Probably the most important thing to find out is *how* the computer is being used. That's true in any type of program. If you see only electronic-flashcard activities in your child's classroom, and you're convinced



ILLUSTRATION BY TIM LEWIS

that the computer must be used as a tool and to develop logical thinking skills, you can raise the question at a conference, or even set up a special time to meet and discuss the program. If you're already computer literate, you might offer your services as a classroom aide—specializing in computers.

Another area to learn about is the choice of software used in the classroom. School programs generally reflect that choice and it's a major decision, one that parents may want to be involved in. Whether you're just

curious, or want to offer some of your own expertise, the parent-teacher conference is a perfect time to ask for a demonstration of the software your child is using.

It's important, though, to understand what a software program *does*. When kids come home from school and report that they've been "playing on the computer," some parents wonder whether their kids are goofing off. It's vital to understand that computers can be persistent and patient teachers, and that kids can have fun while learning.

DANA RUBIN is a reporter for the San Jose Mercury-News. BOBBY GOODSON is a computer resource teacher in the Cupertino (California) Union school district.



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Don't assume that children who say they've been playing games haven't been learning. Many of the programs in the game format have a great deal of merit; they have very sound underlying educational values. So before you dismiss a computer game, look at it carefully to determine what skills and information can be learned and whether there are subtle, but valuable lessons inherent in the program.

Another question parents often ask is how teachers are trained to teach on computers. Again, there's no fixed answer, and different theories about when children should learn different skills affect how to react to the answer. Many educators believe children should not begin to program before fifth or sixth grade. That would mean that teachers at the lower elementary levels don't need to know much more about computers than how to turn them on and insert programs. If the software is well designed—or "friendly"—the computer will do all the work. In these instances the teachers' expertise remains their ability to judge the educational validity of a program and whether it teaches a skill better than more traditional learning media.

When students in some districts start learning to program, their teachers usually will need special training—at least eight hours worth. Some teachers learn these skills in district-wide programs, while others are taught in special classes offered by computer stores and companies.

Computer instruction, like everything else associated with the machine, is in its infancy. Often, a computer is brought into a school because of one interested teacher. In other schools or districts, the movement starts at the top, and there's a school or district-wide program, including a full curriculum, teacher training, and, often, parent involvement. One of the most common reasons for the wide variations in computer use in the classroom is that it often reflects how much experience the staff has with computers. As school personnel become more familiar with computers, policies broaden and become more flexible.

As a program expands, you may become concerned about how much time your child is spending with a computer in the classroom and whether the machine is being used to replace the teacher.

Harvey Barnett, a Cupertino ele-

mentary school principal, answers that concern to parents at his school by explaining, "Our philosophy is that computers don't teach. The computer is merely a good helper, but it's no substitute for a person. Children learn best in a group situation—the interaction, the talking, the listening to other kids' questions. Computers can't do all that, but they do enrich and reinforce and provide the practice needed to make those lessons stick."

MAKE THEM LITERATE AND LOVABLE

After parents understand all the technical aspects of a school's computer program—the "who, what, where, when, and whys"—they'll want to ask something more intangible: How computers are affecting their child's development as a human being. When parents bring their questions to a parent-teacher conference, they're finding that computers can affect aspects of a child's maturity they may have never considered.

Lynn Nordby, mother of two daughters in the Cupertino school district, said she still asks teachers the same questions: What kind of a person is my child? Is she kind, nice, happy, adjusted? Does she get along with her classmates? But more often than not, she says, there's a new twist to some of the answers. She cited a recent example. During a conference last spring, her daughter's teacher told her that nine-year-old Annie was catching on to computers so quickly that the teacher had deliberately seated her next to the only terminal in the class. That way, Annie had become a kind of teacher's aide, helping her fellow students with their work. The extra responsibility, and the additional contact with her peers, had given Annie more self-confidence about her school work.

The teacher's remarks caught Lynn Nordby by surprise. She'd never dreamed that computers could help her daughter's social development. In fact, at first she'd assumed just the opposite. Many parents reason that way: If my kids are spending hours in front of computer terminals, isn't it likely that they'll lose their social skills?

As computers continue to find a place in the classroom, parents need to ask teachers these and other critical questions. In turn, teachers need to provide clear answers about how

computers fit into the educational equation.

There's no question that the advent of the computer has changed the nature of the parent-teacher conference. But teachers cannot be expected to deal with all of a parent's concerns about the use of computers. Most parents are convinced that their children will need computer skills to do well in the adult world they'll face. That conviction is often the number-one motivating force behind bringing a computer into the home. The key to a successful computer education, whether in the classroom, in the home—or both—is parental involvement.

PARENT EDUCATION

One of the first steps to a successful parent-teacher conference where computers are on the agenda is for those parents who are unfamiliar with computers to take the time to learn about them. To best understand what your children are doing at school and at home, you may need to return to the classroom yourself.

When her two sons came home from school babbling about computers two years ago, Jan Gil of Cupertino was offended. "That kind of put me off," she said. "I've always been one who's up on things, and all of a sudden my kids were coming home talking about how they'd mastered this certain piece of software or were learning to boot a disk—things I didn't understand. I was afraid they'd have more knowledge than me. I don't know if it was jealousy or what, but I just felt left out."

Gil took her concerns to her kids' teacher, who encouraged her to take an introductory computer class offered by the district. Soon she was hooked. And in the process, she and her husband Nick discovered a new way to relate to their children. "This was just another area of their lives that I could share," she said.

No matter where you get your first taste of computers, the fact remains that a little knowledge can stir up a lot of curiosity. Once you understand the basics, you'll come up with more complex questions about the way computers fit into your children's education. You'll want to know specifics about the work your children are doing, how they are advancing, and what results you can expect. The parent-teacher conference is an opportunity to answer these, and other, questions. ☐

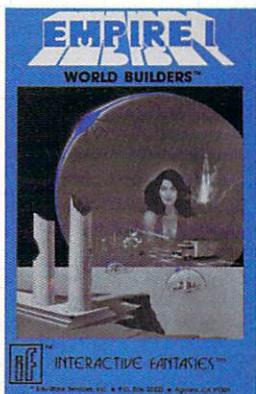
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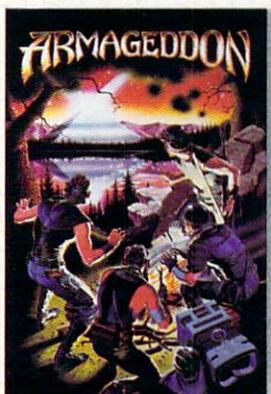
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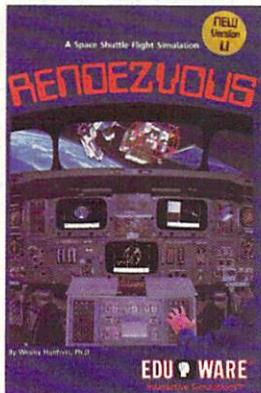
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COMPUTING CONFIDENTIAL

NEW MAN ON CAMPUS: The Computer

BY SARAH KORTUM

Computers are affecting the social life in high school. While traditional values (good looks, nice clothes, and popularity) aren't about to disappear, a new crowd, with different values, is emerging: the computer crowd.

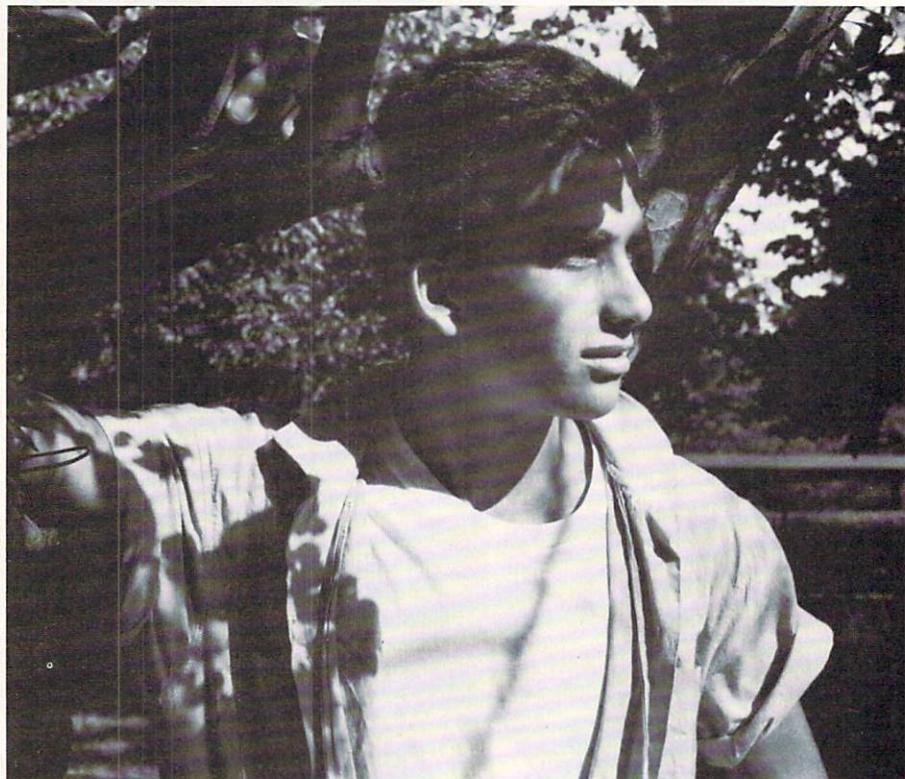
"They don't have a label yet, it's just 'Oh, he's into computers isn't he?'" says 16-year-old Ethan Dubrow, who has just completed his sophomore year at the coed Crossroads School in Santa Monica, California. "Since the newer, fairly inexpensive home computers have come out, and software is available, the computer crowd at our school has really become a new thing." Ethan first noticed the crowd in the fall of 1981, as his school was increasing its collection of Apple computers. "Before that I had never heard of them."

But its members have always existed, many hidden in the unobtrusive high school "bookworm crowd," who are "looked down upon by others. Probably the biggest stereotype in high school is that people who don't party, who don't have fun, are the biggest losers," says Ethan.

Now these same people are being noticed. "The people who were smart but didn't have anything going for them socially now have something with the computer," says Ethan. "Before they had nothing. They could get good grades but that's not something you usually bring up. But computers are very visible. They're a relevant topic. People can see that these guys are good with computers and respect them for that. It gives them sort of an added status."

Now they are easily identifiable walking down the halls. "They might carry with them a couple of disks and a disk box to class," says Ethan. "And their books. And maybe a software manual."

"In class they will sit together in a certain section and discuss comput-



PHOTOGRAPH BY SARAH KORTUM

ers." But where they all come together is in the computer lab. "You can always see them in there, sharing the new programs they've written," says Ethan. "It's a fairly small, square-shaped room with terminals lining the walls. It's sort of stuffy because there are no windows. It's not messy; they don't allow food in there. But it's sort of noisy: the sounds of beep tones, the whirling of disk drives, and the chatter of people talking."

BREAKING BARRIERS

Ethan is part of an emerging new breed of "crossover" students who are members of other high school crowds, yet frequently cross boundaries into the computer circle to seek advice about their own computers. Ethan describes his friends as a crowd that "likes to party, likes to have a good time, and likes fast, ex-

pensive cars." Many own their own cars: BMWs, Mazdas, jeeps, and Rabbits. Others borrow their parents' Porsches. The girls dress "beboppy: miniskirts and white pumps," while the guys often dress "in a James Dean-ish sort of look: faded levis and an old T-shirt, but neat, very neat."

Ethan got his first computer, an Apple II plus with a disk drive, as a fifteenth birthday present in the late summer of '82. "And it was shortly thereafter that I became friends with people in the computer group," he explains. One reason he asked for a computer was "because to graduate from college one of the things I'm going to need to be is computer literate." He immediately began to try to teach himself how to program.

When he encountered a problem, "I would write all my questions out. And then once a night I would call

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this guy up [from school] who was good with computers. He would say, 'Well, I know the answers to most of those questions, but talk to so and so.' And than I would go to school the next day and talk to the guy [who was recommended]. And I would go in the computer lab about once a week and talk to everybody. That's basically how I got into the computer crowd.

"The relationships I have with the computer people seem to stay within boundaries," says Ethan, who estimates that he's one of only half a dozen crossover students in his school of approximately six hundred. "We only talk about pertinent matters, about computers. We don't talk about our personal lives at all."

Some of Ethan's friends can't understand what he could possibly have in common with a computer crowd member, and resort to humor out of confusion. "I'll be talking to a guy who's into computers," says Ethan, "and then I'll walk back to my friends and they'll go, 'Oh, just planning a heavy evening with so and so?' Or they'll criticize the computer peoples' dress: 'Look at the way so and so is dressing,' or their social habits. It's usually sarcastic, usually malicious."

But Ethan thinks such rivalry between groups is natural, especially in high school, where separating into groups is a way of defining who you are. "I think you are defined by who your friends are," says Ethan. "Groups are a way to criticize others." Sometimes the sarcasm masks a jealousy. "I don't think the cooler groups would give up what they've got for what the computer crowd's got, but they might be a touch jealous," concedes Ethan.

"A lot of times my friends will come over and see the computer in my room and they'll say, 'That's really cool, do you know how to use it?' I'll say, 'Yeah, somewhat.' And they'll say, 'Gosh, I wish I could learn. I've been wanting to for a while. I'm hoping to take a course soon.' These people want to learn about computers because I'm sure they see there's going to be a big future in that, and that it's going to become basically a necessity later on."

DIFFERENT STANDARDS

While the computer crowd might not compete for nice clothes or popularity, as Ethan's crowd does, they do compete to see who has a better system, says Ethan. Almost everybody in the computer crowd has his

or her own home computer, usually an Apple to match the brand used at school. Most own at least one disk drive, usually two. Many have modems, and a great number have printers.

"The qualities respected in the computer crowd are the ability to use a computer and be proficient at it," describes Ethan. This emphasis on computer proficiency is reflected in the ages of the crowd members.

"The more popular crowds seem to be more segregated in terms of age, maybe two grades will mix together," says Ethan. "But the computer crowd has a cross section of ages because they realize that people in all grades, especially the younger grades, have a lot of things to offer, which in a popular or cool crowd they might not. People who are 16 or 17 won't benefit from someone who is 14. It would be a hindrance to try to go to clubs with them, and they can't drive. Well, the computer crowd kids who are 14 can write better programs than kids who are 17, and they can share what they've done."

"They usually make [programs] that have already been done," says Ethan. "But they don't copy them, they try to make their own without

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looking at the other one, and see how close they've come. It's like progress building; they're seeing how good they're getting. I know one who wrote a *Pac Man* program. Of course it's already been done, but he wanted to see if he could do it.

"It's an accomplishment to be able to break copy guards. It's very respected among the computer crowd," continues Ethan. [See "Sign Off," page 112.] "Something that these people usually do for their services is ask for the original disk program, and give the copy back to the owner of the original. The benefit of that to the owner is that he then has a copyable disk that he can trade, while the person who did it has an original. People don't pay; it's illegal enough as it is. I don't know if their parents know. If someone is caught in the computer lab at school using a terminal to copy disks, he might be expelled."

INCREASING VISIBILITY

The computer crowd is proud to demonstrate their computer skills to other students in the school. When a vocabulary test was announced as part of the final exam, many students who had failed to jot down

each new word every day panicked. One student typed every word into his home computer, made printouts for the class, and suddenly became quite popular near test time.

"I think the computer crowd is easier to talk to than some people think, and they're more willing to talk," says Ethan. "I've never been refused help if I've asked a question about computers, because it's something that they're proficient in and they're glad to show their expertise."

Ethan disagrees with the computer recluse image portrayed in the summer hit *WarGames*. "It [the movie] backed up the stereotype that all they do is sit home and play with their computers and plot things and build their computers around themselves. I think that's a stereotype that's not always true. They're not obsessed with their computers; it's not the only thing in their lives. There's schoolwork, that comes into play, and some of them do play sports. They read a lot of suspense novels; I often see them passing around Ken Follett novels."

The stereotype didn't seem to bother the computer crowd. *WarGames* was a big hit with the group, says Ethan. After the movie came

out, "all the computer crowd was talking about it: 'Oh, the computer screen in the war room looked just like all these games I have at home!' 'Yeah, I have the same ones!' And then they talked about all the flaws in the movie. They found plenty. All of the criticisms were technical: how this couldn't happen, how that couldn't happen!"

Is the computer crowd here to stay? Ethan thinks so. He already sees its numbers growing. "The ratio of computer people to noncomputer people in the younger grades is getting higher, just because they're brought up with computers." Ethan counts only "three to four seniors" who are really into computers, while in the youngest grade there are maybe "two to two-and-a-half dozen."

How is this going to affect the status of the computer crowd in high school? "I think as more and more people start to buy computers and they become more popular, everybody will be talking about computers. I think it's going to be at least a few years, but eventually it'll be that way. I think the computer crowd will gain even more status because they'll have more power. Then they'll really stand out." ■



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COMPUTING CLINIC

THE VIRTUE OF CP/M GIBBERISH ON THE SCREEN COMPUTING WITHOUT READING

BY WALTER KOETKE

My children are using the software I buy them without even reading the instructions. Won't they develop bad habits this way?

No, I don't think so. If their method works, it works. A great deal of the software available today, especially that used in schools, is self-explanatory. Since your children's use of the computer is probably self-motivated, their "Look, Ma, no hands!" approach to using software seems like a good one. Indeed, a major appeal of the computer will be as a tool for intellectual exploration.

"If all else fails, read the instructions," is a familiar saying among computer users. It's a good motto to go by. If reading the instructions doesn't work, then your children can ask others for help.

What is a DOS, and what does it do?

DOS stands for Disk Operating System. It's a special program, usually supplied on a floppy disk, that controls all disk-related activities. A DOS on disk can be used only after being loaded into the computer's memory. This loading process is called "booting the disk" or "booting DOS."

The DOS is used whenever you list a directory of programs, load a program, or save a program. The DOS also controls the physical location and format of whatever is written on the disk. Did you ever wonder why several programs can be saved on the same disk without conflicting with each other? DOS is the answer, because DOS maintains a complete record of how the space on each disk is allocated.

WALTER KOETKE introduced computers into U.S. public schools, linking the Lexington, Massachusetts, system to a mainframe in 1964. In 1969 he worked with Seymour Papert, inventor of LOGO, who brought that programming language to the same school system. He has written for Creative Computing and Microcomputing magazines, and frequently lectures about computers to parents and educators.

Sometimes my screen turns to gibberish. Usually the problem goes away if I turn the computer off and let it sit awhile. What causes my computer to do this?

The symptoms seem to indicate a heat-related problem. Be sure none of the vents on the computer have been blocked. Those vents are necessary for the air circulation that cools the computer.

Your computer should not require any special cooling accessories unless you've added additional plug-in boards. If the problem persists, return the computer for service, and the heat-sensitive component can be replaced. Be sure you describe your difficulty as completely as possible when you ask for service.

Gibberish can also be caused by static-electrical discharge, a situation most likely to occur in the winter when rooms are hot and dry. Possible solutions to this problem include installing antistatic mats or a humidifier, spraying the carpet with a solution of fabric softener and water, or removing the carpet altogether.

What's so great about "CP/M compatibility," which several computer manufacturers and software producers are advertising?

CP/M stands for Control Program for Microcomputers. It's a disk-operating system that can be used with many brands of computers. CP/M, supplied on a floppy disk, is often standard with a business computer and is available as an option for many other computers.

CP/M has several advantages over other disk-operating systems, the most outstanding of which is compatibility. In general, a program written on one computer under CP/M can be easily moved to another computer under CP/M. The second advantage is the wealth of available software. There are about 3,000 different—and significant—applications programs available for CP/M systems.

If you want to use your computer

for business tasks, then the availability of CP/M is an important consideration. If education and/or recreation represent the major applications, then don't worry about CP/M. There is almost no educational or recreational software available that requires CP/M be available.

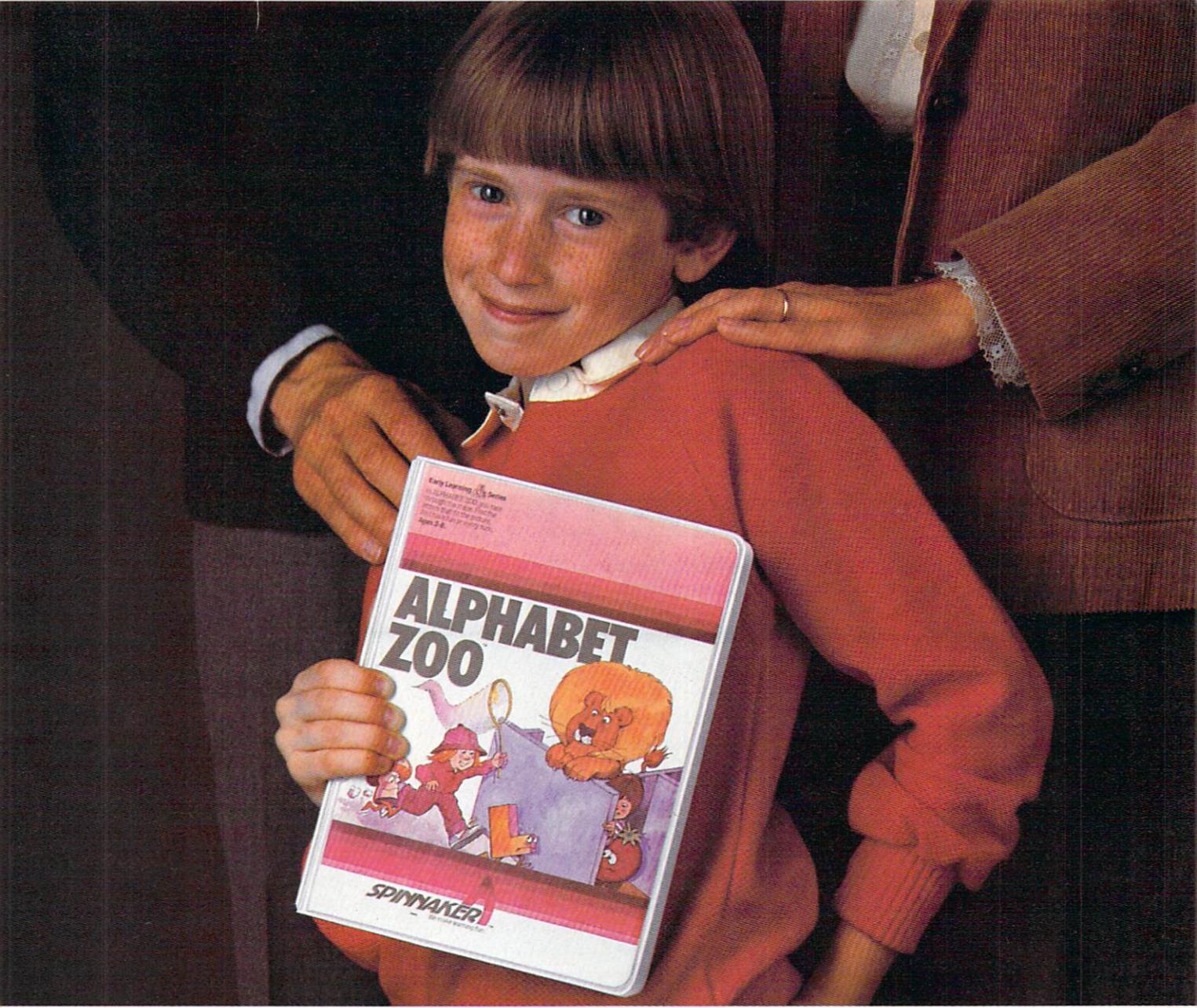
I just bought a Commodore 64, which is supposed to have 64K RAM. When I turn it on, it says I have only 39K available for use. What happened to the rest of my memory?

All of your memory is still there: 64K of RAM and 20K of ROM for a total of 84K. However, the microprocessor chip in your Commodore 64 is capable of addressing only 64K at any one time. When you turn on your computer, the chip must use the 20K of ROM to obtain BASIC, the operating system, and the standard character set; and it uses about 5K of RAM for miscellaneous system overhead. Since the chip is using 25K of memory just to provide BASIC and associated system functions, only 39K of RAM can be used by your program before the 64K maximum is reached. Rest assured that the 20K of seemingly unused RAM in your computer is not lost. Programs written in machine language, as many are, can access this RAM because they do not require the 20K of ROM containing BASIC.

How do I tell how much memory my computer (it uses Microsoft BASIC) has left at any given time?

The Atari and Commodore versions of Microsoft BASIC will display the amount of RAM left when you type PRINT FRE(0). For Radio Shack and IBM microcomputers, type PRINT MEM. If the number of bytes displayed is negative, add 65,536 to get the correct answer. ☐

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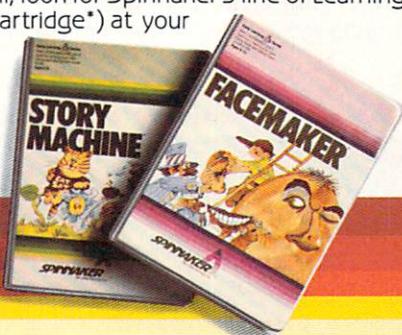
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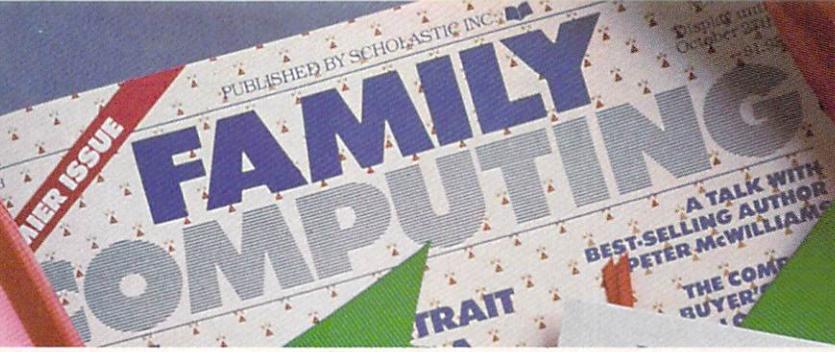
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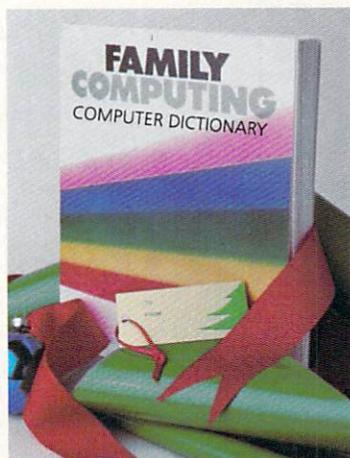
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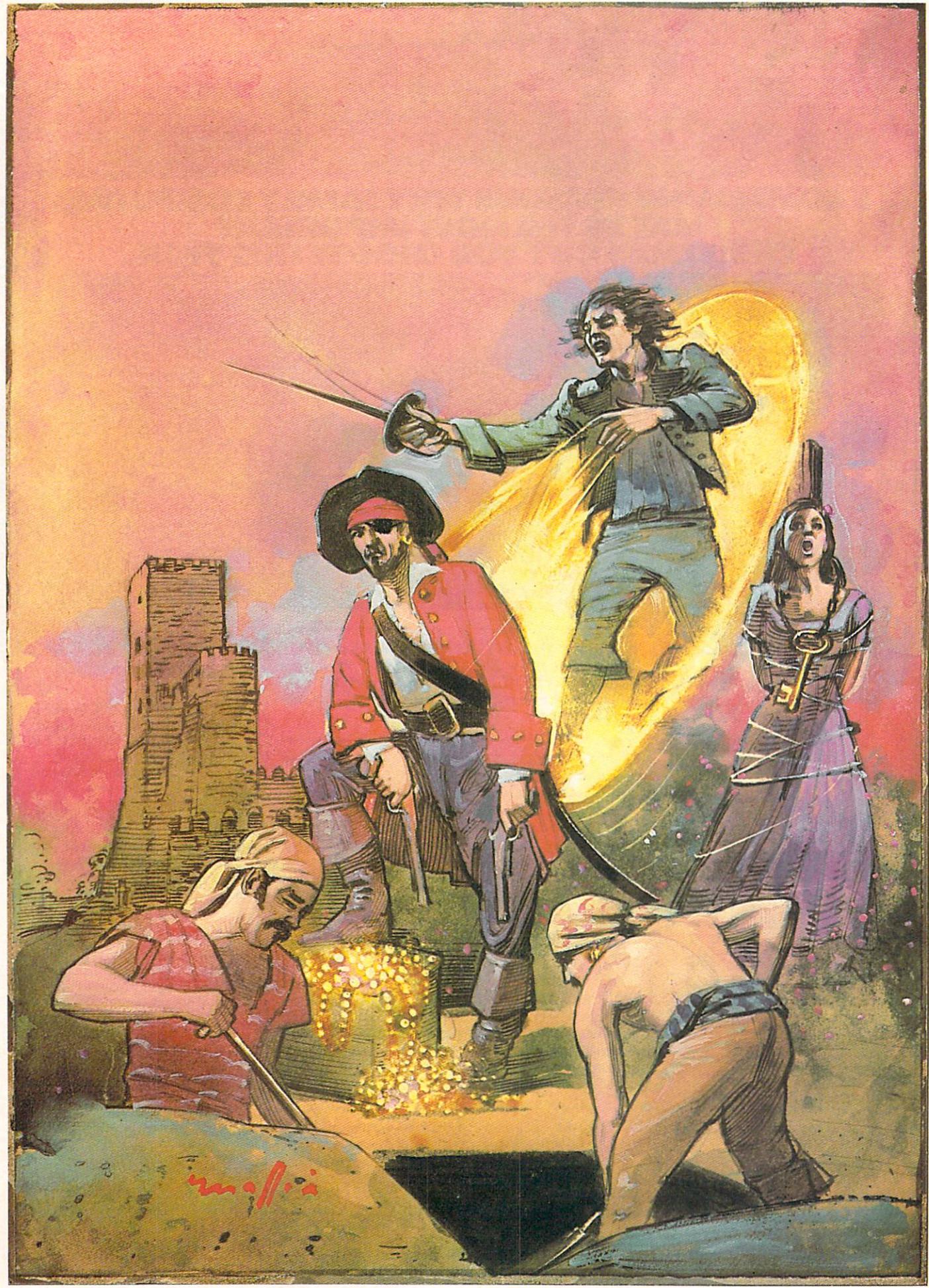
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ILLUSTRATIONS BY DANIEL MAFFIA

The Lure of Fantasy and Adventure Games

EXPLORING BEYOND YOUR WILDEST DREAMS

BY ERIC GREVSTAD

Imagine being Walter Mitty, except with fantasies that don't always go the way you want. No, imagine being a character in a novel, or taking a wrong turn while looking for your theater seat and finding yourself on stage. Or imagine that you've never heard of chess, but are playing a grand master who won't tell you what you *can* but only what you *can't* do. Adventure games—some of the most popular and addictive computer programs—are like that.

Sound like fun? Oddly enough, it is. Adventures are very different from most people's notion of "computer games"—home computer clones of arcade video game hits like *Pac-Man* and *Defender*—but they rival the shoot-'em-ups as software best-sellers. Last June, the Softsel distribution chain's figures showed Infocom's *Zork I* and *Deadline* in third and fourth place (behind *Zaxxon* and *Frogger*) on the game list. Five of the top 10 games, in fact, were adventures. Fantasy games are adventures' cousins; the fantasy *Wizardry* is solidly in *Softalk* magazine's Top 10, close behind *VisiCalc* and *Home Accountant* and ahead of *Screen Writer II* and *PFS: Report*, all best-selling business programs.

What makes adventures appealing (and often frustrating) is that they're interactive—you don't play an adventure, you participate in it. In effect, you talk to an adventure program; you type words and press the ENTER or RETURN key, rather than moving a joystick and pressing the FIRE button. *Space Invaders* will continue to send aliens at you in the same (admittedly complex) pattern until you're eventually overwhelmed; adventures will present you with different situations depending on your responses. The result calls for logic and problem solving instead of hand-eye coordina-

tion. Game players live by their reflexes; adventurers live by their wits. Game players say "Yikes!"; adventurers say "Hmmm."

ESCAPE INSTRUCTIONS

Basically, an adventure puts you in a strange and usually dangerous environment and assigns you a task: collect the treasure, solve the murder, defeat the dragon. Exactly how to do that, or how to stay alive in the meantime, is left up to you. To succeed you must figure out what you want to do, and how to do it. The latter involves giving instructions to the computer using a vocabulary and syntax it can understand.

A typical adventure might begin by displaying, as text on the screen, the message, "You are in a dungeon cell. There is a door to the east and a crawlway to the south." What you want to do, presumably, is get out of the cell. Since the fundamental adventure command is a two-word (verb and noun) sentence, you might type LEAVE CELL (or GO EAST) and press the ENTER key. In that case, the program might give the fundamental adventure response: "You can't do that."

Are you frustrated? Not until you've tried 20 or 30 synonymous phrases and have struck out. Your best bet is to EXAMINE DOOR ("Examine" is the most useful verb in the adventure dictionary) and read the additional information, "The door is closed and locked."

BREAK DOOR. "You can't do that."

KICK DOOR. "You hurt your foot, but kicking the door has no effect."

GET HINGE. "I don't know the word hinge." The word isn't in the program's vocabulary. Either it does know a synonym, or the concept is irrelevant and you're on the wrong track.

TWO SKILLS ARE NECESSARY FOR ADVENTURERS: MAPPING, AND A TASTE FOR WORDPLAY.

ERIC GREVSTAD is news editor of 80 Micro, a TRS-80 users' magazine.

WHY DO VIDEO GAME PLAYERS SAY "YIKES" AND ADVENTURE GAME PLAYERS SAY "HMMM"? BECAUSE ADVENTURE/FANTASY GAMES MAKE YOU THINK, WHILE YOU'RE FREE TO DREAM.

There is no combination of words that will let you take the door off its hinges.

UNLOCK DOOR. "You don't have the key."

Aha! Most adventures always know what you're carrying—INVENTORY is a helpful command—and, though your pockets are empty at the moment, you know there is a key somewhere.

GET KEY. "I don't see it here." If it were there, it would have been in the opening description.

GO SOUTH. "You are in a crawlway south of the cell. There is a key here."

GET KEY. "Okay." (If you typed INVENTORY now, it would say "you are carrying: a key.")

GO NORTH. "You are in a dungeon cell."

UNLOCK DOOR. "The door is unlocked."

GO EAST. "The door is closed." Adventures are maddeningly methodical.

OPEN DOOR. "The door opens easily."

GO EAST. "You are in a courtyard. There is a door to the west and a road heading north." Going west would, of course, put you back in the cell.

This would be only the beginning of the adventure, and an elementary one at that. Many adventures accept complete sentences rather than restricting you to two-word patois: nearly all take "E" or "S" as shorthand for GO EAST or GO SOUTH. (Some read only the left-most characters of each word. Experienced space travelers in Avalon Hill's *G.F.S. Sorceress*, confronted with a metallic hatch, briskly type EXAM MET HAT, meaning, "Examine Metallic Hatch.")

Clearly, interaction challenges programmers as well as players. An adventure game must be prepared for any of many possible instructions, while an arcade-type game might recognize only MOVE LEFT, MOVE RIGHT, and FIRE. Such sophistication has its price, both in terms of game cost (\$20 to \$100 apiece) and computer memory. A fair version of *Lunar Lander* will fit in a 5K VIC-20, but most adventures require a 32K or larger system with disk drive—a machine such as an Apple II or IIe, TRS-80 Model III or IV, IBM PC, or Commodore 64. There are, however, some 16K cassette adventures, and some of genre pioneer Scott Adams's original stories have been condensed onto VIC-20 cartridges.

FROM D & D TO PDP

Adventures and fantasy games trace their pre-electronic origins to *Dungeons and Dragons*, the role-playing board game in which several players explore a world created by, and face combat under rules known only to, a combined author and referee known as the dungeon master. Within the dungeon master's framework, mathematics and probability—involving, say, a

character's "strength" or "intelligence" points, combined with some dice rolling for luck—determine the outcome of various moves: "All right, you chose to use your axe instead of a sword and killed the troll," or "Sorry, you're in front of the combination lock but you can't figure it out."

The first to assign the master's role to a computer were Will Crowther and Don Woods, who in the mid-70s wrote a game called *Colossal Caves* (or, more popularly, *Adventure*) on a DEC PDP-11 minicomputer at Stanford University. A few years later (1978), Scott Adams of Orlando, Florida, wrote the first microcomputer adventure on a TRS-80 Model I. Adams's *Adventureland*, inspired by, but not a direct translation of, the Crowther and Woods archetype, started the adventure explosion.

A GAME OF PATIENCE

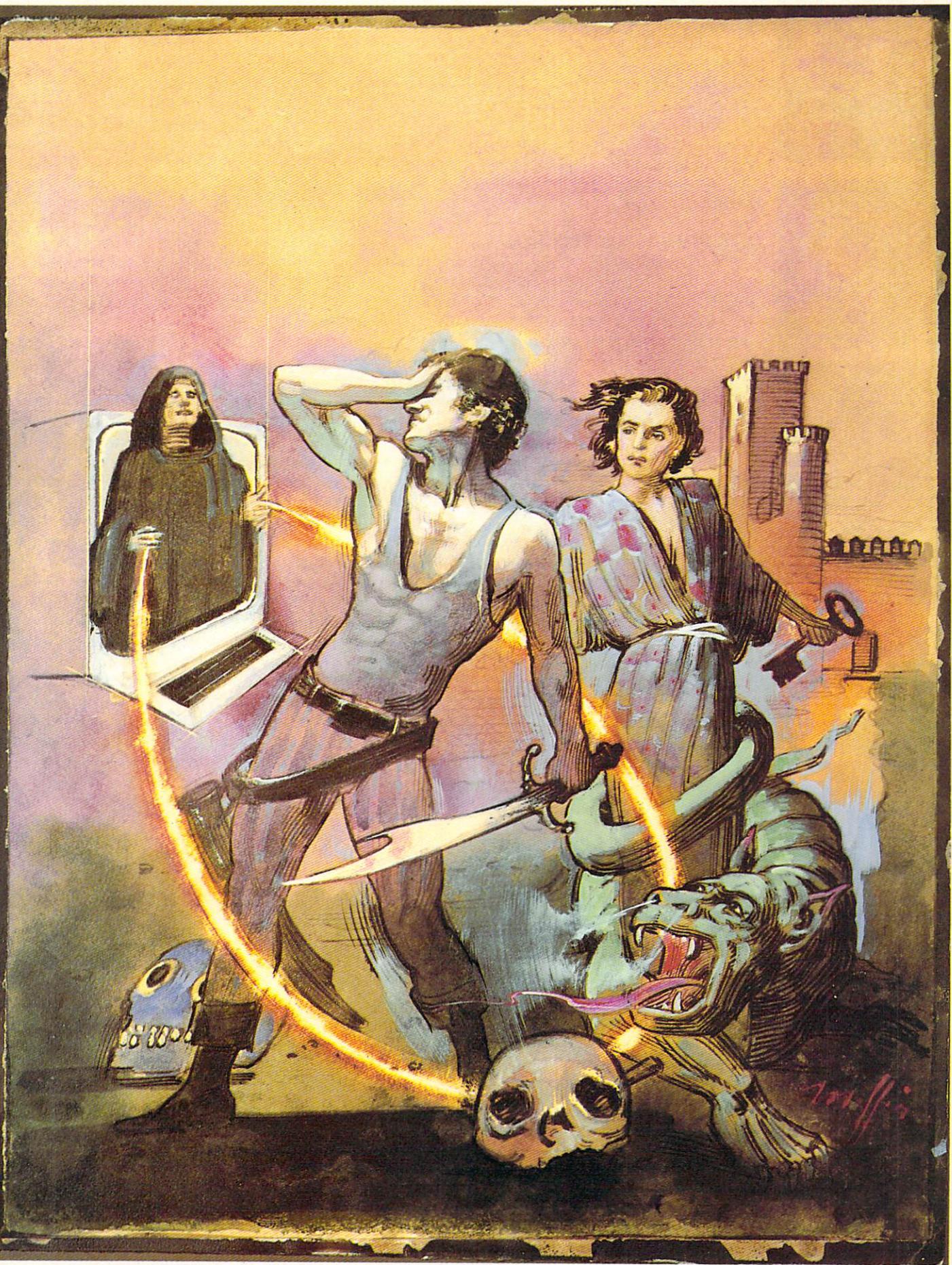
Most adventures take 30 to 40 hours to solve. (Mercifully, that's not at one sitting; you can save a game in progress on a floppy disk and pick up later where you left off.) In addition to trial and error, a willingness to second-guess insidious programmers, and perhaps a dictionary of synonyms, two skills are essential for would-be players.

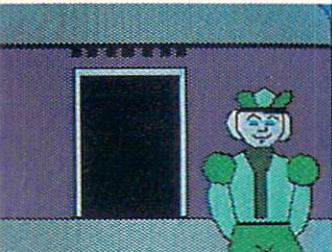
The first is mapping—adventuredom's word for taking notes, sketching a map of each location you visit. East of the Druid's chamber, for instance, you might find a treasure room; north of that, an unfriendly wolves' lair that you'll want to avoid on future visits to the treasure room. Combined with every adventure's Rule #1, "Examine everything"—there may be a magic scroll on the dusty table; the pistol you found may not be loaded—maps are indispensable. They help even in the genre's worst cliché, the maze (or forest or desert), where moves in any direction bring the same mocking information, "You are in a maze."

The other prerequisite is a taste for wordplay, or at least a tolerance for the programmer's warped sense of humor. The original *Adventure*, after you blunder into its maze—"You are in a maze of twisty little passages"—occasionally sends a different message to cheer you up: "You are in a twisty maze of little passages," or "You are in a little maze of twisty passages." The arrangement of words in these sentences compile a code; figure out the code and you'll know exactly where in the maze you stand.

Other codes are sprinkled throughout adventures. There's a magic lamp in Adams's *Adventureland*; type RUB LAMP and a genie appears with a diamond ring. Type it again and the genie gives you a diamond bracelet. Try a third time and the genie, growling "Boy, are

"THERE'S AN OLD SAYING THAT A PICTURE IS WORTH A THOUSAND WORDS. UNFORTUNATELY, ON AN APPLE IT'S WORTH 1,000 BYTES."





Three screen shots from Sierra-On-Line's *Time Zone*, which takes you through 3,000 years of recorded history. You are in a cave (top). You are inside a Buddhist temple, and see a statue of Buddha with an emerald in his navel (middle). You are on deck at the stern. Christopher Columbus is standing here (bottom).

"you greedy," snatches back his treasures with an angry roar of thunder.

Even worse is *Subterranean Encounter*, a TRS-80 adventure from Toucan Software. After turning north at the fork in the road, you meet an unfriendly hermit who will invariably strangle you to death—unless, showing an adventurer's sense of the surreal, you've typed EXAMINE FORK and TAKE FORK. The fork in the road, you see, was a dinner fork, suitable for stabbing hermits.

READING VS. WATCHING

Adventure clues, if not adventure puns, can also be transmitted visually. Thousands of puzzle buffs take their adventures straight—that is, with only maps and the mind's eye to illustrate scenes described in text on the computer screen—but by the time adventures reached home computers, with Apple and Atari high-resolution graphics, it was inevitable that some would add pictures to prose. Many current best-sellers display each "room" (adventuredom's term for any location, whether a closet or a swamp, church or barroom) and its contents, giving only a short caption and space for the player's command.

In the choice between text and graphics adventures, graphics fans point to impressive color illustrations and purists retort that thinking peoples' books don't have pictures in them. They might also add that graphics slow down play a bit; you must wait several seconds for the program to draw each room, even if it's one you've seen a dozen times.

The real decision for the game designer involves allocating memory space. As Robert Woodhead, coprogrammer of *Wizardry* puts it, "There's an old saying that a picture is worth a thousand words. Unfortunately, on an Apple it takes about 1,000 bytes." In other words, graphics, while adding to an adventure's appeal, take RAM and disk space that could be used for trickier puzzles.

SWORDS AND SPELLS

A middle road between graphics and text, and one which stays the closest to the *Dungeons and Dragons* spirit, is that of fantasy games, which send one or more players wandering through a treasure- and monster-filled multilevel labyrinth.

Fantasies' graphics—usually a sort of overview or "You are here" map—are more modest than illustrated adventures, and players are limited to a handful of legal moves rather than having a wide range of options under an adventure vocabulary. The simplest fantasies might be compared to arcade games, with cursor keys replacing a joystick, plus a few buttons for fighting, picking up or dropping objects, and occasionally casting spells.

The difference, or advantage, is that fantasy game characters change, gaining strength or experience or wisdom as the game progresses. Your Level 1 warrior, encountering a

couple of skeletons in a dusty cellar, is given the choice of fight or flight; choosing to fight, after a few turns' worth of swings and misses on both sides, you may defeat the skeletons and thereby qualify for Level 2, which means thicker armor and better odds in your next encounter. After a while, you'll be either dead or a formidable—Level 12, say—fighting machine, sweeping up treasures and tackling monsters who grow ever fiercer as you proceed.

(Should you finally retire undefeated, as a Level 27 warrior with 5 million experience points and enough vigor to shrug off an axe blow, several companies offer sequels that load that character from your original game disk and put him into an even tougher neighborhood.)

Besides mapping, fantasy games require ardent bookkeeping. The fantasy hit *Wizardry* allows up to six characters, each from one of five species, holding one of eight jobs, with one of three alignments—good/human/priest, neutral/gnome/warrior, evil/dwarf/thief, and so on—plus around a dozen other characteristics, not to mention the various equipment (short or long sword, leather or chain armor) each carries. This makes for a superbly varied and rewarding game, but it also makes for some very hardcore, D & D-style game fanatics.

ADVENTURES AND REAL LIFE

While there have been one or two stories, even tragedies, involving young people who got carried away by or tried to act out *Dungeons and Dragons*, there don't seem to be grounds for parents to worry about kids hooked on computer adventures. If nothing else, logic and language skills might be at least as worthwhile as the hand-eye coordination promoted by video games.

While fans argue that an adventure that takes about 40 hours to play is no worse than a novel that takes several hours to read, parents may wish for different kinds of adventures. *Conan the Barbarian* is still the prototype for too many adventure characters; young children might be better off looking for *The Dark Crystal* (Sierra On-Line's computer adaptation of "The Muppet Movie"), or trying to solve a *Snooper Troops* (Spinnaker Software) mystery, than hacking away at the sword-toting warriors. Or they might wander through most of recorded history in *Time Zone* (Sierra On-Line), a \$99.95 graphics adventure that fills six Apple disks. You won't find that kind of adventure in a video arcade.

Compared to video games, in fact, adventures represent something of a phenomenon: wildly popular problem-solving exercises. Rather than laser blasts or instant gratification, adventures offer a challenge akin to a crossword puzzle that talks back. Except for the adventures that are too hard to even begin, you enjoy them even if you can't finish. And if you do solve one, you can try the words you've learned in the next. ☐

BRIEF ENCOUNTERS IN ADVENTUREDOM

Adventure International

Box 3435, Longwood, FL
32750; (305) 862-6917

Scott Adams's text Adventures 1-12 started an industry. Spruced up with graphics in Apple and Atari versions, they're still creditable competitors. The RETURN key toggles back and forth between a scene's picture and description: elementary two-word sentences answer the "What shall I do?" prompt. *Adventureland*, the first of the series, is good fun and a fine introduction to the genre, if you don't get bogged down carrying treasures. Climb the cypress tree before you chop it down.

(Apple II plus, Atari 800/1200, TI, TRS-80)

Datamost Inc.

8943 Fulbright Ave.,
Chatsworth, CA 91311; (213)
709-1202

The ads for *Aztec* look like rejected *Raiders of the Lost Ark* posters, but fans say the fantasy combines modest graphics with one-key options for everything from crawling through holes to lighting dynamite. *The Missing Ring* is an enjoyable warmup for *Wiz-ardry*—up to five characters, each from one of nine classes, can stay together or split up to

find treasure and battle beasties.

Make sure the CAPS LOCK key is down, and never mind the graphic tangle when your character, a treasure chest, and three giant rats all occupy the same screen space. Worst complaint: Combat can drag on for minutes. I haven't seen "Swish! Missed!" so many times since I gave up softball.

(Apple II/II plus/IIe/III)

Infocom

55 Wheeler St., Cambridge,
MA 02138; (617) 492-1031

The owners of the abandoned house had troubles they couldn't sweep under the rug. *Zork I* is the program that showed what a text adventure could be: it's spawned a fan club, the sequels *Zork II* and *III*, and the All-Time Most Popular Adventure spot in a Softalk readers' poll. Infocom has gone on to become the premier adventure publisher: their packaging and documentation alone are better than many companies' games (the science fiction text adventure *Starcross* is packaged in a plastic spaceship), and they're the most detailed, literate, and witty writers in the business. Nobody handles complex sentences better.

Suspended is a science fiction *tour de force* (you control six robots, each with different capabilities and quirks, spread over a mammoth and besieged scientific complex). The mystery thriller *Deadline* is arguably the best adventure published to date. Three new games, including the mystery *Witness*, are here or coming. Not for beginners, but the class of the field.

(Apple II, Atari, Commodore 64, DEC RT-11/Rainbow, IBM PC, NEC PC-8000, TRS-80 I/III, T1 Professional)

Mind Games Inc.

420 S. Beverly Dr., Suite 207,
Beverly Hills, CA 90212; (213)
277-8044

The Desecration is a much-advertised "Adventurecade"; as you complete sections of an adventure (such as stealing a spaceship and dodging the air defenses), the program shifts to three different arcade games, and you get some action. The game sections have nice graphics, but the adventure's an appalling model for young children: you are the "Intergalactic Assassin" (sic), proud of the luxuries and one-night stands of your profession, and hired by business rivals to murder one Dunmark

Pykro.

The game is riddled with misspellings and grammatical errors by way of tough-guy talk ("Am I see'in things again? Look's like an alien"), and clumsily plotted.

(Apple)

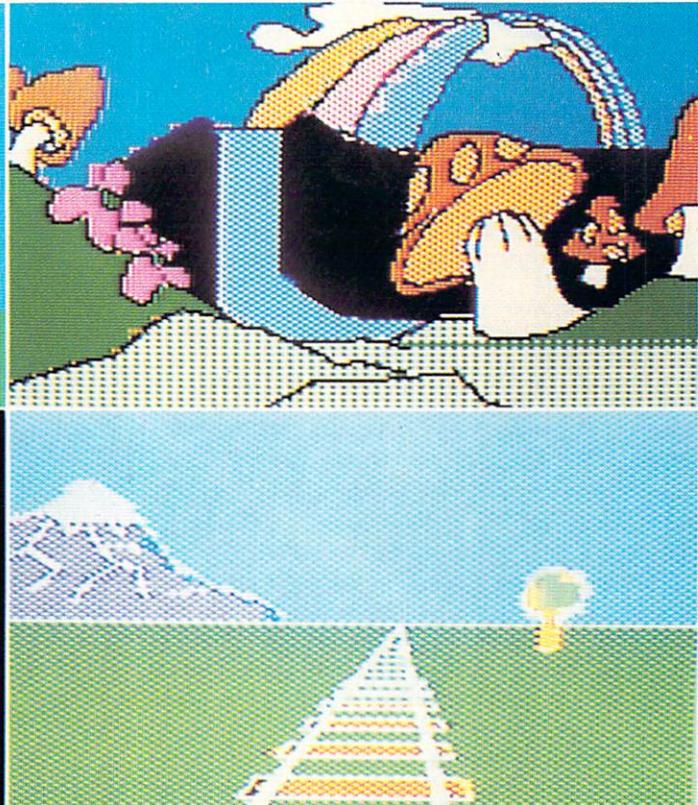
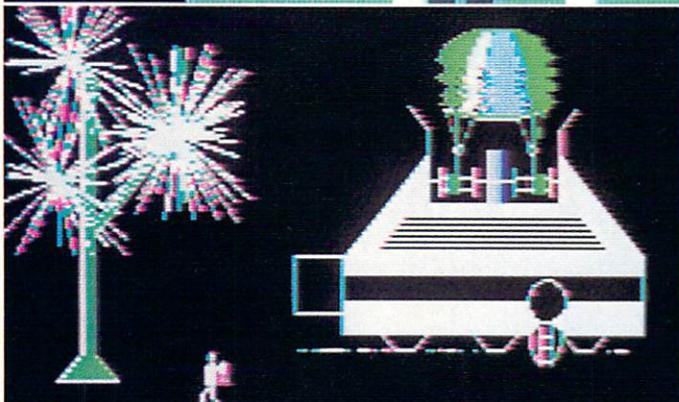
Screenplay

P.O. Box 3558, Chapel Hill,
NC 27514; (800) 334-5470

Dunzhin is TRS-80 Model III/IV owners' answer to *The Missing Ring*: low-resolution graphics, but a great series of mazes (revealed from overhead, but only as you blunder through them) full of monsters and treasure and healing and teleportation rooms. Unlike other fantasy games, *Dunzhin* lets you control how fast you move (from a cautious step to a headlong run) and where to aim in battle. Don't even think of taking on a cavebear until you're a level 10 warrior. The saga continues in *Kaiv* and *The Wylde*, which can load existing *Dunzhin* characters. *Asylum* and *Asylum II* are two of the company's popular and tricky adventure games.

(*Dunzhin*, *Kaiv*, *Wylde*:
TRS-80, Atari 400/800, Apple II, Commodore 64; *Dunzhin*:
IBM PC; *Asylum I*: TRS-80,
IBM PC; *Asylum II*: TRS-80)

Screen shots (clockwise): Snooper Troops, Adventure #2, In Search of the Most Amazing Thing, Kabul Spy.



Sierra On-Line Inc.

Sierra On-Line Building,
Coarsegold, CA 93614; (209)
683-6858

Ken and Roberta Williams's firm is the pioneer in graphic adventures and some rank their fantasies—*Time Zone*, *Ultima I & II*—with *Wizardry*. The graphics on *Cranston Manor* are particularly vivid. *The Dark Crystal*, which fills both sides of two disks, is like the Jim Hensen movie—not gripping but thoughtful, beautifully drawn, and pleasantly low-key. The adventure takes two-word sentences: steering the Gelfling hero Jen through a creature-filled forest, I tried TALK CREATURE. Answer: "This is 'The Dark Crystal' . . . not 'Dr. Doolittle!'"

On another level is *Time Zone*, the six-disk adventure that spans 3,000 years.

(*The Dark Crystal*: Apple II/II plus/Ile, Atari 400/800, IBM PC; *Time Zone*: Apple II/II plus/Ile)

Sirius Software Inc.

10364 Rockingham Dr.,
Sacramento, CA 95827; (916)
366-1195

Kabul Spy is an enjoyable James Bond-style adventure with good if not stunning graphics showing your quest to rescue a professor from the KGB. Don't get sucked into anything at the airport. Parents may not want their kids to visit Quetta, Pakistan, a town so unfriendly there's a force field around the bar; the bar's called The Devil's Den, and the phrase to gain entrance is GO TO HELL—which is what the game tells you if you ask for a hint. *Critical Mass* has a dark side, too—the player must find and stop a madman intent on blowing up the world—but it's got great graphics and arcade-style sequences.

(Apple II/II plus/Ile, Atari, Commodore)

Sir-tech Software Inc.

6 Main St., Ogdensburg, NY
13669; (315) 393-6633

Hours of fun? More like years. Not only are there nearly infinite combinations of adventurers, but your *Wizardry* team can spend time at an inn, tavern, trading post, training ground, and temple—all before they enter the maze where the loot and monsters are! There's an excellent instruction manual; you'll need it.

Wizardry is too complex for many, but stands as the reigning fantasy champion—the screen display and scorekeeping is outstanding—and a virtuoso feat of programming. There are two other "scenarios," *Knight of Diamonds* and *Legacy of Llygarn*, that load *Wizardry* characters. If you're an adventurer with the soul of an accountant, or vice versa, bring scratch paper and dive in.

(Apple II/II plus/Ile/III with emulation, IBM PC)

Spinnaker Software

215 First St., Cambridge, MA
02142; (617) 868-4700

My first impression of *Snooper Troops I* was that it was too complicated and required too much pre-game study for me, let alone a 10-year-old. But I was charmed by the intricate yet logical story (strange goings-on at the Cable mansion, with eight thoroughly credible suspects) and the terrific combination of sound, graphics, and keyboard control in Tom Snyder's program.

Careen around town in the SnoopMobile (which isn't easy: if some cars stop on a dime, the SnoopMobile takes about \$20), catch beeping bulletins from the Snoop Wrist Radio, interview everyone, write everything down. Solve this—or *Snooper Troops II*, or *In Search of the Most Amazing Thing*—and you're ready to graduate to *Deadline*.

(Apple II plus/Ile, Atari 400/800/1200, IBM PC, Commodore 64)

—E.G.

HOW TO PROGRAM AN ADVENTURE IN BASIC

While today's best-selling adventures are formidable feats of programming, the logic behind interactive software rests on a few fundamentally simple commands. In BASIC, you can write an ultra-elementary adventure with three statements—PRINT, to display information on the computer's screen; INPUT, to accept the player's instructions; and IF . . . GOTO lines, to trigger different responses according to input.

Here's a thumbnail adventure based on a single fork-in-the-road decision:

```
10 PRINT "YOU ARE IN A CAVE."
20 PRINT "SUDDENLY A MONSTER ATTACKS!"
30 PRINT "SHOULD YOU RUN OR FIGHT?"
40 INPUT A$
50 IF A$="RUN" GOTO 80
60 IF A$="FIGHT" GOTO 90
70 GOTO 30
80 PRINT "WHILE RUNNING, YOU FALL INTO A PIT
AND ARE KILLED!":END
90 PRINT "YOU DEFEAT THE MONSTER AND FIND TRE
ASURE!":END
```

After describing the situation, the program poses a question in line 30. Line 40 waits for your response (A\$ is a string, i.e., a nonnumeric, variable).

The response RUN sends the program to line 80, showing the result of your ill-chosen action. If you answered FIGHT, the program skips line 50 for line 60, where it's ordered to jump to line 90 and display the news of your victory. Line 70 is an error-trapping line, which patiently repeats the question until you hit upon one of the two acceptable answers.

How does this epic compare with commercial adven-

tures? Well, the latter have larger vocabularies: a more sophisticated program would understand ATTACK, HIT MONSTER, FLEE, RUN AWAY, and so on, as well as the two words used here. And real adventures don't have simple forks in the road, but place settings for 12; there may be a dozen possible responses, each of which would trigger a branch to a different display, as well as helpful messages instead of blank silence for error trapping.

Many commercial programs aren't written in BASIC, either. Some of the simplest use assembly or machine language to speed up play, and some are state-of-the-art material. *Wizardry*, for example, consists of over 14,000 lines of advanced Apple PASCAL.

That's not to say you can't write a good adventure in BASIC. Moreover, the thought and planning required to keep track of the many alternatives—does the character run or fight, live or die?—develops skills that will aid any would-be programmer. *The Adventure Writing Data Sheet*, by Roger Olsen (\$3.95 from Aardvark Systems Ltd., 2352 S. Commerce, Walled Lake, MI 48088), is a good resource. It explains in detail the techniques of writing a BASIC adventure; and cassettes of the adventure program itself are available (\$5) for the TRS-80, TRS-80 Color Computer, and VIC-20. Another find is *Genesis: The Adventure Creator* (Hexcraft Software), which allows you to create your own text adventure with up to 97 "rooms," or locations. You make the map of the game and enter all the text descriptions, and *Genesis* does all the programming.

But if you're more adventurous, just expand the above sample program by a few thousand lines, and you might find yourself with a treasure.

—E.G.

The Wizard of Wizardry

AN INTERVIEW WITH THE GAME'S DESIGNER

BY NICK SULLIVAN

Wizardry is a role-playing fantasy game that lets a player create and control up to six characters who quest for loot and glory. Since its 1981 release, it's become one of the best-selling computer programs of any kind. In each of Wizardry's three "scenarios," or games, characters gain strength and power as they battle through the monsters in dungeons and mazes, and move to more difficult levels of play. They can then be "loaded" into the next scenario.

Andrew Greenberg, a Ph.D. candidate in computer science at Cornell University, designed and programmed the prototype version of Wizardry. The actual program code for Wizardry was written by Robert Woodhead, also a Cornell graduate and now a part owner of Sir-tech Software, the game's publisher. Greenberg, 27, who has also designed and programmed video games for arcades, first started toying with computers at age 17, when he was selling hot dogs at the Monticello (New York) Raceway and became friendly with technicians in the track's computer room. Today, he's founder of a company in Ithaca, New York, that develops educational and recreational software. He visited FAMILY COMPUTING one day last summer, when this interview was conducted.

FC: How did you get started on *Wizardry*?

Greenberg: I started it when I was an undergraduate at Cornell University. During one reading period—the time before exams when everyone plays bridge, poker, and scrabble—I was extremely bored. I was acting very petulant; until one of my friends said, "Why don't you put *Dungeons and Dragons* on your computer?" I started to do that, before deciding that *Dungeons and Dragons* was unsuited for a computer. I wanted something less rigid, so I began to experiment.

FC: And the next thing you knew . . .

Greenberg: . . . the next thing I knew my room was full of friends testing out the prototype I had designed. This play testing went on for months, day and night. My room was so crowded I often couldn't find a place to sleep. But the play testing was great, pushing me further and further up the learning curve, giving me new ideas for fine-tuning.

FC: You've said that the game is very well balanced. What do you mean by that?

Greenberg: Several things. First, we had to find a way to keep people playing a game that

cannot be won. The solution was to continually throw out new carrots for people to chase. These new carrots—in the form of new characters and new obstacles—keep coming, and you never know what they'll be until they appear.

The other aspects to balance are clarity and depth. Clarity, in any game, is the ability to see the big picture. Chess and tic-tac-toe have this. Depth is the actual complexity of the game. Chess has this, but tic-tac-toe doesn't. A lot of video games have depth, but no clarity. *Wizardry*, like chess, has enough clarity so the game is not one of guesswork, and enough depth to challenge the intellect.

FC: What do you mean the game can't be won?

Greenberg: There is a stopping point. You can finish a scenario, and pick up the loot. But then you can take your developed characters back to the start and improve them. You can create new ones. That's the whole idea of the game—creating new personas and improving them. And you can't really win at that.

FC: What inspired your imagination when designing the game?

Greenberg: Arthurian legends, Celtic legends, and the history of medieval Japan and Europe. I've done a lot of reading and research in those areas. The world of *Wizardry* has to be real, and it has to be consistent. This, too, is part of the game's clarity.

FC: What about wicked Werdna, the guy who controls the mazes. What inspired him?

Greenberg: Werdna? That's me; it's Andrew spelled backwards.

FC: What are Werdna's qualities?

Greenberg: He's self-righteous and evil.

FC: How does the latest scenario, *Legacy of Llylgamyn*, differ from the others?

Greenberg: *Legacy* was a major breakthrough. Instead of using one menu on the screen, and tucking the maze shot into a corner of the screen, we show three or four menus at once. [The menus list magic spells, magic items, character names, etc.] These are like the "windows" used on the Apple Lisa and Xerox Star computers. When you change one piece of information in one menu, all the other menus automatically update their own information. And when you don't need the menus anymore, you can erase them so that the maze is left in the center of the screen.

FC: Why are there so few graphic depictions in *Wizardry*?

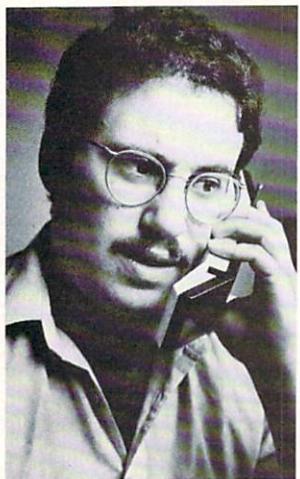
Greenberg: We're not telling people a story. They're telling their own story. It's in their imagination. The computer is not capable of graphically representing a person's imagination. Rather than doing it badly, we just sug-



PHOTOGRAPHS BY PAM BENHAM

"WICKED
WERDNA?
THAT'S ME.
IT'S ANDREW
SPELLED
BACKWARDS."





gest what the monsters look like. There's an aspect of theater to it. If you can't recreate the Taj Mahal, you don't try to; you just give a hint, a suggestion.

FC: Why did you write the game in PASCAL?

Greenberg: Because PASCAL is a very compact language, and the program is huge. Each scenario has about 14,000 lines of code; and secondary programs used to develop the scenarios have about 10,000 lines of code. Using assembly language, for instance, would have required five or six times as many code lines. Without PASCAL, the game wouldn't be playable on a 48K computer.

With PASCAL, you can easily identify the places in the program that need to be changed or altered. This is handy, because many players send in disks to Sir-tech and ask the company to retrieve dead characters.

FC: Has piracy been a problem for you?

Greenberg: Somewhat, but as long as there are people finding new ways to steal games, we're going to find new ways to protect them. Actually, I think it's becoming less and less of a problem. Unless organized crime gets into piracy, there are going to be very few people equipped to do it.

FC: Do you consider these "cheat" programs that allow people to create characters of increased strength and ability a form of piracy?

Greenberg: I consider it sleazy. The people putting out these kinds of programs never approached us beforehand. Fortunately, they're not selling too many. The programs are bad for two reasons. They destroy the balance of the game, by allowing users to modify characters—add strength, guile, or whatever. Second, since we're constantly making improvements in the scenarios, these utility programs are incompatible and can ruin the disks. And Sir-tech, with its notable backup policy, ends up bearing the cost of broken disks.

FC: What kind of people play *Wizardry*?

Greenberg: We don't have exact figures, of course, but the two main groups seem to be teenagers and young professionals in the 25–30 age range. Teens like the game because it's like rolling dice; young professionals like it because it challenges their intellect.

FC: What's your doctoral thesis about?

Greenberg: Programming methodology—ways to write big programs faster and better.

FC: What's a big program?

Greenberg: Any program too big to fit in your head. Any program too big to conceptualize while you sip cognac in your easy chair. I really mean that.

FC: Can *Wizardry* fans look forward to more scenarios?

Greenberg: Yes. The fourth scenario, being designed by Roe Adams, will be called *The Return of Werdna*. I've got most of the design for the fifth scenario already mapped out. There won't be a final scenario. Each one starts a new sequence. There's also a good possibility of a *Wizardry II* series, which will require a 64K computer and two disk drives.

FC: What would you be doing now if you hadn't been bored stiff during exam period three years ago?

Greenberg: I probably would have gone to law school.



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WORKING OUT FEARS THROUGH FANTASY: A PSYCHIATRIST'S TALE

"When a child describes what his hero can or can't do, he's giving clues to the obstacles and troubles in his own life," says Dr. Ronald Levy, a child psychiatrist who practices near Buffalo, New York. This is the theory Dr. Levy was operating by when he used the computer game *Wizardry* to help analyze—and cure—a troubled, young boy.

Besides opening a window into a child's mind, Dr. Levy says, *Wizardry* teaches the importance of power and cooperation. "It's not just one person against the world; each of the six characters has to carry his share of the load. And if you don't overextend your abilities, you will progress toward a goal."

Dr. Levy's story is short, simple, and true. "The child—let's call him Jim—was living in a family with serious marital problems. Jim, an otherwise bright and capable child, had begun to do poorly in elementary school. I saw Jim on an emergency basis after he announced to his family that he was going to kill himself. When he came to my office, he let everyone know that he did not want to be there, and he refused to talk to me at all.

"This sad-looking, school-age child sat quietly in my office staring at the floor, while his parents sat in my waiting room worrying about him. Because the child had declared his intention to commit suicide and was uncooperative with my efforts to interview him, I could do little but consider admitting him to a psychiatric hospital.

"However, after some coaxing, Jim finally agreed to play video games on my Apple computer. He liked that so much I started telling him about *Wizardry*, and he was fascinated. He started playing, made a set of characters and gave them names. He was an uncommunicative child, but the game was an icebreaker. He began telling me what he was doing in the game, and I was able to learn a great deal about him from watching him create and describe his characters.

"As Jim talked, I found that he wasn't as depressed as he had seemed. We discussed his problems and worries, using the game as a springboard. At the end of the visit, he told me he had no intention of killing himself because he wanted to come back and play some more. Each time he came back to play and talk, he seemed better.

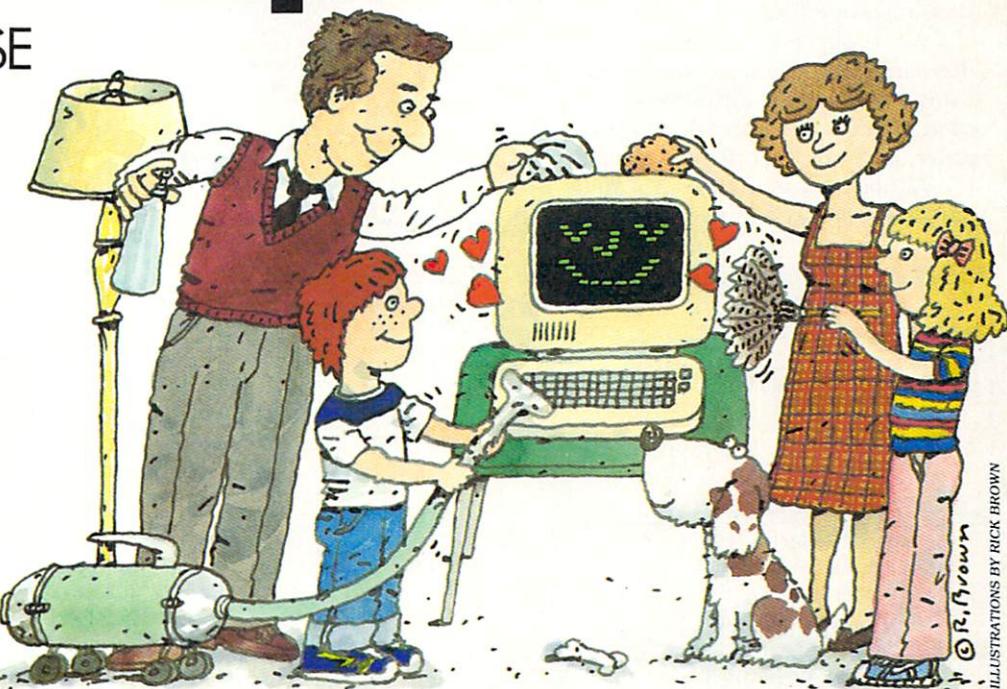
"Jim recovered his good health and self-esteem in quick order, and stopped coming to my office. That was two years ago, and he's still fine today."

—N.S.

How to Care for Your Home Computer

COMMON SENSE
IS THE BEST
PRESCRIPTION

BY HEIDI WALDROP



ILLUSTRATIONS BY RICK BROWN

It probably took you months to decide which computer to buy, and then once you brought it home, was it easy to set up the contraption? Now all you hear about is how fragile the machine is and how much time it takes to keep it in working order. Another household chore is just what you needed, right? Wrong. It isn't as complicated, or as time consuming as you think to keep your computer humming. Simple, common sense care can head off problems and keep the number of visits to the repair shop to a minimum.

A computer isn't a mysterious piece of machinery with a mind of its own, even though some do talk back to you. Its care is similar to that of a stereo system. Basically, a computer has electronic and mechanical parts. The electronic parts should be replaced when they blow out, and the mechanical parts need to be kept clean to function properly.

Each part of your computer requires special care. The following list offers basic guidelines and helpful hints to keep it running smoothly.

DISK DRIVE

Because it has the most mechanical parts, the disk drive is usually the trouble spot. But following a few simple steps will help you avoid most problems. The biggest enemies are dust and dirt, so invest in a dust cover for protection, and clean the disk drive heads every other month. There are cleaning kits available that do the job quickly and efficiently. A kit usually includes a special disk made of a sponge-like

material and cleaning fluid you squeeze onto the disk before placing it into the disk drive. The disk then simply spins to clean the head. A less expensive option is to use rubbing alcohol in place of the cleaning fluid.

New or overeager computer owners sometimes clean the disk drive heads too often—don't! This is not a case when more is better. Cleaning more often than the instructions recommend can wear down the delicate heads. Be sure to read the manual carefully, and don't overdo it.

To prevent dust buildup, you should probably keep the disk drive door closed, although on some double-headed machines this puts undue pressure on the disk drive heads. Ask your dealer what's best for your computer.

DISKS

Taking care of disks is simple. In general, the same rules apply as for record albums. Disks need to be kept in their jackets and away from dust, extreme heat, or cold. Disks should



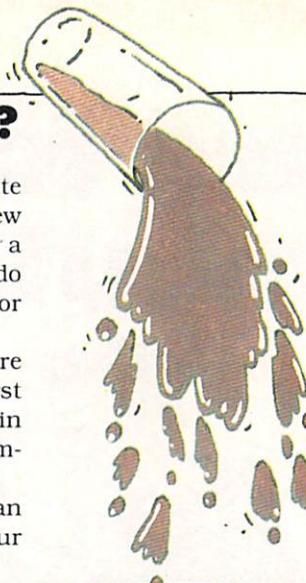
HEIDI WALDROP often writes on computer-related subjects. She is a frequent contributor to Electronic Learning, also published by Scholastic Inc.

WHAT WENT WRONG?

The seven-year-old has just spilled chocolate milk on the keyboard of your brand new computer. After a sharp reprimand and a reminder about the house rules, what do you do next? How do you clean it up—or should you even touch it?

We've all faced times when we're sure the computer has been damaged. The first thing to do, in all situations, is to remain calm. Take a deep breath, unplug the computer, and call your dealer or repair shop.

Although it is a good idea to develop an ongoing relationship with someone in your



neighborhood who can fix your computer or advise you about repair problems, you won't want to place hysterical phone calls every time something appears to go wrong.

The following chart includes some problems that dealers around the country cite as the most common. There are many things computer owners can do on their own, but the experts stress that you should never attempt anything that makes you nervous. The biggest danger in computer care is when the inexperienced person reaches his or her hands inside the machine.

PROBLEM	PROBABLE CAUSE	CURE
The image on the screen blinks on and off intermittently.	Defective cable or receptacle.	Watch the effect on the screen as you move the cable back and forth to be sure it is a problem with the cable. You can check the specific cable by replacing it with a working one borrowed from a friend. If your cable is defective, it will need to be replaced. If moving the cable has no effect on the screen, it is most likely a receptacle problem and you will need to take the computer in.
The screen shimmers, blanks, then comes back on . . . you've lost what you are working on. Or the image on the screen grows very faint.	Static, a surge of voltage through the cables, or a "brown-out."	The best cure for this problem is prevention by both putting the computer in a static-free environment, and using a voltage-surge protector and an Uninterrupted Power Supply unit.
Programs won't load properly.	Something in the disk drive: dirt, corrosion, or the dog's bone.	If there isn't a bone, think about the last time you cleaned the disk drive heads . . . then do it.
Something is spilled on the keyboard or the casing is cracked.	Someone wasn't following the house rules.	Don't try to clean it. Just unplug the computer and take the keyboard in to your dealer.
The cord has been chewed.	The dog.	Unplug the computer, then detach the damaged section of cord and take it in for replacement.
Strange lines, letters, or symbols appear on screen.	Most likely the ROM or RAM cards.	If your computer has removable cards, replace them with a friend's cards to see if yours are defective. It could also be that heat has caused the ROM and RAM chips to expand and become loose. All you need to do is open the computer and press down on the chips for a good contact. (CAUTION: Opening some computers voids the warranty.)
The disk drive doesn't sound right. Or "read" errors appear on the screen, e.g., "ERROR ON DRIVE B." Or a program won't run.	Disk drive alignment or revolutions are off. Or the heads are dirty and worn.	It's normal for a disk drive to run at about 288 revolutions per minute—plus or minus four. If the speed is off, especially if it's too slow, you will get those symptoms. It happens most often when you have used someone else's disk drive to copy a program. You might be able to avoid a trip to the repair shop with the help of a speed adjustment disk, available for less than \$20. It's a good idea to have a program like this on hand for such occasions. Check your local users' group about the program for your computer—there may be a no-cost one in the public domain, as with the Atari. If you have cleaned the heads (as you should do every two months) and adjusted the revolutions, and you still have problems, most likely you have alignment problems and need to take the disk drive in for repair.
The computer simply won't work!	It could be something special . . . follow your checklist.	<ol style="list-style-type: none"> Are the cables all plugged in according to your chart? Is the disk in correctly? Not backwards or upside down. Are you sure the disk has information on it?

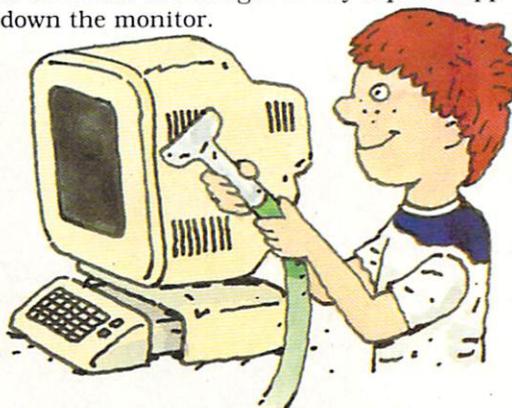
be stacked vertically, but not too tightly together, and kept away from magnetic fields, such as your monitor. Never bend the disks, or touch the surface. When writing on the label, always use a felt-tip pen. Anything hard like a ballpoint pen will damage the disk.

One prevention technique that is often overlooked is reinforcing the center hole on your disks. If your disk didn't come reinforced, that can be accomplished with a simple and inexpensive (about \$15 for a dozen rings) device called a "floppy saver" kit. The floppy saver is a strengthening ring that fits around the hole of a disk, similar to the reinforcement rings a student uses on paper for a three-ring binder. It's best to attach a floppy saver before you use a disk for the first time.

MONITOR

The only parts of a monitor that really need attention are the vents and the screen. A dust cover will protect it from the environment, but you may also want to use the hose attachment on your vacuum cleaner to clean the vents occasionally.

The screen can be cleaned with any glass cleaner or antistatic spray and a lint-free cloth. Antistatic sprays, which provide added protection from static—and clean well, too—are available at most computer stores. Lightly apply the cleaner to the cloth, and then wipe the screen to eliminate the danger of any liquid dripping down the monitor.



KEYBOARD/CENTRAL PROCESSING UNIT

When there's trouble here, the most common culprits are the children. Sometimes they become overzealous and punch away on the keys. That can lead to the cost of replacing broken keys or, even worse, the entire keyboard. Explain to your children that they don't need to hammer on the keys—the electrical connection will work just as well with a soft touch.

Cleaning the contacts inside your computer is something you shouldn't do too frequently, but you might try it when a program isn't working. Sometimes it's simply a matter of oxidation, dirt, or corrosion buildup that breaks the electrical current. If you are able to open your computer (such as with the Apple), it's easy to reach inside and clean the contacts

with an eraser. (Be sure not to leave bits of eraser inside.)

There are also multipurpose cleaning kits, available for about \$6, that include a special fluid, sponge-tip applicators, and lint-free towels. Some people feel more confident using a kit, but rubbing alcohol and tightly wrapped Q-tips can do the trick. CAUTION: Check with your dealer on what you can clean and what should be left to an expert. When in doubt, don't touch.

PRINTER

The only upkeep on the printer (other than changing the ribbon) is keeping the rollers clean and the paper running smoothly. If your printer is open to the environment, it will gather dust more often, so use a cover.

Be sure to keep records of when you last replaced the print heads; follow the manufacturer's instructions to determine whether this is a do-it-yourself or a repair-shop job. If you have a daisy-wheel printer, the wheel can be cleaned with a kit much like those used for typewriters. You should be able to find one at your local computer store.

CABLES

The first thing to do with the cables is to make a diagram of what is plugged in where, and why. It can save a lot of headaches when the cables are accidentally pulled out or the computer is moved.

To child- and dog-proof the cables that run along the wall or floor, gather them with rubber bands or cover them with electrician's tape (available at any hardware store). Avoid running cables along the floor where they can catch someone's foot or be stepped on.

A problem that comes up, although not the fault of the cables, is when a brief, but high, voltage surges through the power line. This occurs with no warning and can quickly wipe out a day's work. You can avoid it with a voltage-surge protector, which prevents high voltages from affecting your computer. Regulators come in all shapes and sizes; they cost anywhere from \$40 to \$140, but are usually worthwhile investments.

Another problem computer users encounter is a "brownout," which is caused by an overwhelming demand for power in a household—or city. To protect yourself against losing whatever's in your computer, you need an Uninterrupted Power Supply unit (called a UPS); they generally cost \$200 and up.

As a rule, good prevention techniques will help you avoid a variety of problems. Be sure to set up strict rules for home use of the computer and clear responsibilities for each member of the family. And if there's a problem, consult the accompanying chart. If you still can't get the computer running properly, call your dealer or repair shop. **TC**

CRUNCHING NUMBERS FOR THE LITTLE LEAGUE



Little League baseball players often dream of playing in the big leagues—the bright lights, the crowds, the World Series. But no matter where you play the game, it's the same—spitballs, dusters, cracked bats, and computers.

Yes, personal computers are the latest change in the modern Astroturf era of the old pastime. The New York Yankees, Oakland Athletics, and Chicago White Sox use them to track every pitch and every hit. And the Darien

(Connecticut) Little League uses them, too, thanks to 16-year-old Perry Pierce.

Pierce is the head scorekeeper and statistician for the 12-team, 156-player league. Two years ago, he figured and recorded batting averages by hand. Last year, after a winter of programming, he used a computer to do the same work. It was faster, of course, and proved an invaluable aid to players and coaches.

"At first, I thought the coaches would look



PERRY PIERCE TAKES THE MAJOR LEAGUE APPROACH

BY JAMES H. BURNS

at my printouts for five minutes, crumple them up, and throw them away," says Pierce. "Instead, the coaches used the stats, and kept them in their planning books. Sometimes, if a kid complained about not starting a game, the coaches referred to the printouts to explain why he wasn't. The players didn't get mad. They kept saying, 'You did all this for us?'"

The program he used, called BASES, was written by Pierce and Robert Locke, a 17-year-

old Darien High School student. The program allows Pierce to figure and record batting averages for each player—by game, for the entire season, or any portion of the season. It also computes a team's overall batting average. And, it records each pitcher's wins and losses, innings pitched, and runs allowed.

Perry started work on BASES last January, when he gained access to Darien High School's Digital PDP-11 (DEC) minicomputer. Prior to

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that, his only computer experience had been reading an Apple manual in a store, and—in junior high—experimenting on a TRS-80, programming an adventure game called *Warrior*. With Locke, an assistant in the school's computer room, and a computer science teacher, Pierce learned the intricacies of DEC's fairly complex BASIC, and began fitting baseball's irresistible logic into the computer.

"We assigned letter variables to the information we entered into the computer," Pierce explained. "As an example, to figure batting averages, we set 'X' to be a player's at-bats, and 'Y' to be his hits. Then, we simply used the input command y/x to get the batting average. To make the process even simpler, we arranged it so that each team had its own file. Within that file, each player had a number, so that the printouts made sense."

By the end of last April, two weeks into the Little League season, Perry and Rob had an "acceptable" model of *BASES*. "I caught up quickly on the paperwork," says Perry, who scores games on paper in the press box above the home plate, then enters the data into a

computer.

"I entered the information into the DEC as soon as I could, usually the day after the game," says Perry. "First, I'd enter a player's name and number. Then, the computer would ask me which game I was entering data for. After I typed in the answer, the DEC asked, **WOULD YOU LIKE TO CHANGE THE AT-BATS AND HITS?** The operation proceeded from there, with the computer finding the required information in each team's files. For one game, it took 10 to 20 minutes to enter all the kids' records."

Last year Pierce used the DEC minicomputer at the high school, but next year he'll use an Apple IIe at home. He bought one with his savings from scorekeeping (\$7 a game), and is rewriting his *BASES* program for it. "It's like a dream come true. The long weekends waiting for the DEC are gone. Now, I can use a computer whenever I want."

Other projects on Perry's drawing board include another adventure game, a money-management program for his grandmother's real estate business, a filing system for research on his father's family tree, and a pro-

THE PROS' EDGE: A NEW DATA BASE

With a leg up on the dugout steps and a wad of tobacco in their cheeks, major league baseball managers know who can hit a southpaw's roundhouse curve, who plays better at night or in the heat, or in the clutch. Now, some managers are supplementing their native "data base" intelligence by consulting computer printouts. They're looking at *Edge*.

Edge 1.000, written by baseball fan and pharmaceutical scientist Dr. Richard D. Cramer of Philadelphia, has already affected the game. The program, which requires ardent bookkeeping skills (every pitch and pitcher, hit and its location, type of playing surface, etc., must be entered into the computer), showed the Chicago White Sox that their hitters were launching their fly balls just short of home-run territory. So management moved Comiskey Park's home plate eight feet closer to the fences.

The Oakland Athletics were the first team to use *Edge*. Last year, team statistician Jay Alves recorded the hits and batter-pitcher matchups for every game from the broadcast booth, with an Apple II plus and three disk drives. One disk drive held *Edge*, and the other two held floppy disks to store statistics on the Oakland team and its opponent. The ballpark computer was linked by telephone to a mainframe computer in Philadelphia, which stored new data and regurgitated existing stats.

This was a dandy exercise, and the broadcasters made good use of the arcane information at hand, but the Oakland man-

ager was fiery Billy Martin, who had no interest in the data. "I've got it all up here," he'd say, pointing to his head. "I don't need that stuff."

But when the Chicago White Sox subscribed to *Edge*, manager Tony La Russa loved the program. White Sox computer operator Dan Evans refined it—so that it could record such minutiae as fly balls bouncing off outfielders' heads. And this year, new Oakland manager Steve Boros also became a fan. "He's very receptive," says statistician Alves. "He goes over computer printouts before every series." At least once this year, the ritual paid off, when a printout's data convinced Boros to keep Dwayne Murphy in the cleanup spot. He responded with a game-winning grand-slam homer.

Last June, the New York Yankees, never far behind in the American League or in new fads, joined the *Edge* club. Guess who's manager?

Does *Edge* provide an edge? That's hard to say, because whatever information the teams get and use is privy. Even the players rarely see it, though they may soon, as some clubs plan to use computer-generated statistics as a "front-office tool" at contract time.

As far as winning and losing goes, traditionalists in the Billy Martin mold will say that weight lifting in the winter and bunting practice in the spring will win more games than computer printouts. After all, most managers don't need a computer to tell them which pitchers can strike out Reggie Jackson.

—NICK SULLIVAN

gram to control the lights in his parents' house. "My father's a little leery about this," says Perry. "He says I'll have to show him how I'll do it before he gives me the go-ahead, so I'm writing a demo program."

The only drawback to scoring 10 games a week (plus playing saxophone in various bands) is that Perry doesn't play much baseball anymore. He's played in Little League, managed his junior high school team for two years, played in the Babe Ruth Junior League, and on the high school team. "It's not out of the question that I'll play baseball next season, even though I'm a little small (5'7") for the Babe Ruth Senior League. It's just a question of deciding what my priorities are."

Meanwhile, Perry's thinking about adapting BASES. "Rob and I are going to modify BASES to include as many statistics as possible. Next season, we'll definitely include ERAs (a pitcher's Earned Run Average, which shows how many runs a pitcher gives up for every nine innings pitched). BASES already records the necessary data, so we'll just program the computer to run the proper equation."

Since BASES has worked "190 percent better than I had ever hoped for," Perry expects that Darien High School, the Babe Ruth Senior League, and leagues in other towns will use the program. And when the Apple IIe version of BASES is ready, Pierce may try to market it commercially.

"The main advantage of BASES for Little League coaches is that they've never really had access to game-by-game statistics before. Although BASES can't record the precise batter-pitcher matchups that the major league program can, the records allow coaches to see how batters do against certain types of pitching—fast versus slow, say—because they know the other team's pitchers. But BASES is just an aid. There are some batters who do well in certain situations—like with men on base—whose skills might not show up in BASES' stats. A coach would never make a decision based strictly on a computer printout." ■

A LETTER FROM PERRY PIERCE

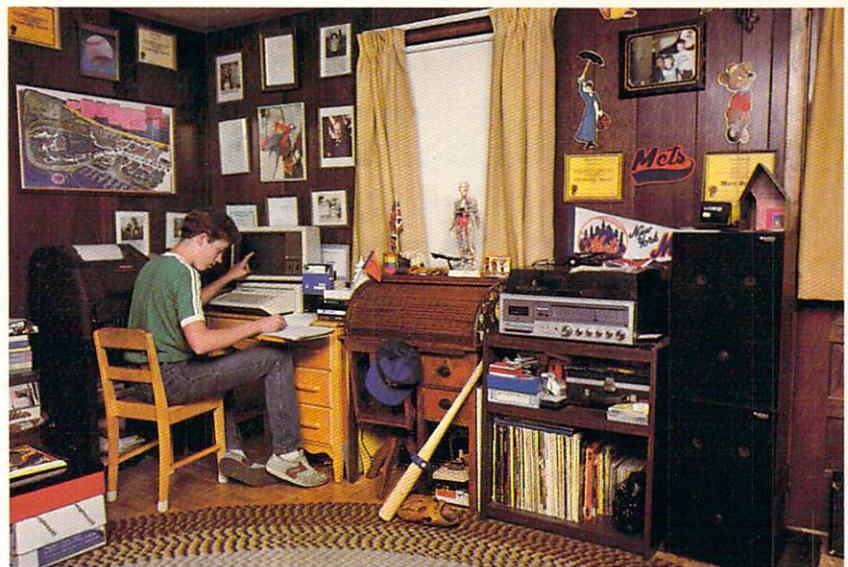
Dear FAMILY COMPUTING:

Please notify readers that they may obtain a copy of BASES, including graphics and pitching statistics, written for the DEC, Apple, and IBM PC computers, by sending a self-addressed stamped envelope to: RAL-11 Software Systems, 53 Echo Drive N, Darien, CT 06820. Thank you and enjoy BASES.

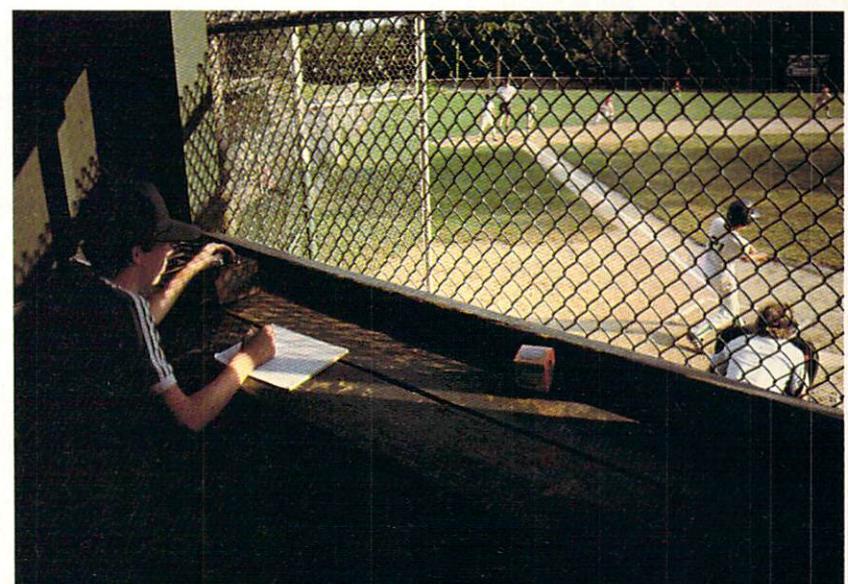
Sincerely,

Robert A. Locke, Jr., President

Perry Pierce, Senior Vice President
RAL-11 Software Systems



PHOTOGRAPHS BY LANGDON CLAY



Scenes from a summer game: Scorekeeper Pierce is hard at work recording (bottom) and entering data (top), while four young prospects relax during a playoff game.

BUYER'S GUIDE TO MONITORS

MONITORS vs. TVs; COLOR vs. MONOCHROME; 40 COLUMNS vs. 80 COLUMNS; AND 36 CAPSULE REVIEWS

When considering the expansion of a home computer system, the new owner's thoughts often turn to disk drives, modems, printers, and other peripherals. The idea of adding a monitor is often overlooked. After all, the computer works well enough with the old color TV in the den, doesn't it?

No, in fact, it doesn't. There are several reasons why a standard TV set doesn't provide ideal computer display. For one, "Dynasty" and DO loops don't mix. Unless a household has a spare TV set, conflicts between BASIC programming and network programming are bound to arise. The second and more important reason relates to engineering. TV sets simply are not designed to be viewed from a close range, as they are when used with computers. TVs are generally unable to provide the resolution (sharpness and clarity) or the contrast needed for good-quality text or graphics display, and can suffer from interference problems. Prolonged use of a standard TV set as a computer display screen can cause eyestrain and exhaustion.

Regardless of the application, if you intend to use your computer for several hours at a typical sitting, a monitor should be high on your list of expansion priorities. But what kind of monitor should you buy? The choices may seem endless, but they can be broken down into four basic categories: 1) monochrome; 2) color; 3) RGB (Red-Green-Blue); and 4) combination TV/monitors. To choose a type and model, you must first define your applications, your budget, and the restrictions of your particular computer.

Remember that a monitor can't alter the inherent resolution of your computer, its style of type, or other qualities of its display. Before you buy, try out various monitors with a computer like your own, preferably with the software you most often use.

TYPES OF MONITORS

Monochrome monitors, which display only one color against a black background and have a fairly high image resolution, are favored for text display, particularly when 80 columns or more of text must be shown. They are available in a variety of screen sizes and several phosphor types—white, green, and amber. (Phosphor is a material used to line the insides of monitor screens.) Professionals generally agree that amber phosphor is easiest on the eyes, with green running a close second.

Most monochrome monitors are designed to accept the video signals generated by home and personal computers, so a special adapter will not be required except in special cases. (Sometimes the natural luminosity of a color computer's background display hinders the contrast in the monochrome display.)

Color—actually composite color—monitors are essentially souped-up color TV sets, without channel tuners. They offer slightly better resolution and color saturation than standard TVs, and, because they can accept video signals directly from a computer, rather than through an RF modulator (required for TVs), they do not suffer from interference. However, the text display of a composite color monitor is limited to a practical maximum of about 40 characters per line. Beyond that, resolution fades, and colors "ghost" and "bleed." Thus, composite color monitors are better suited for games than for text applications.

Red-Green-Blue monitors are specially designed color

monitors that work off three, or sometimes four, separate color input signals. Because of this and other engineering features, RGB monitors are capable of displaying top-quality color graphics as well as 80-column text. The main drawback of RGB systems is their price—ranging from about \$400 to more than \$1,000—and the difficulty of interfacing them with some computers. Most are compatible with IBM PC and Apple IIe computers; for other computers, special devices are required to make the connection.

Combination monitors are a fairly new entry into the marketplace, and show that BASIC programming and network programming *can* mix. Combination monitors do double duty as high-quality TV receivers and normal color computer monitors—and are compatible with most home and personal computers. In some cases, they even accept RGB signals.

Another class of combination monitors functions as one component of a home video or entertainment system, and is most often used by professionals. Most of these monitors do not have audio capability, and must be connected to stereo speakers.

A GUIDE TO THE CHART

The accompanying chart does not begin to cover the entire field of available monitors, but provides a cross-section of popular models from the major manufacturers in each of the four categories. The specifications used to evaluate the monitors are described below.

SCREEN SIZE: Measured diagonally in inches. Larger may be better, particularly for text display.

SCREEN COLOR: Mostly applicable to monochrome models. Amber or green phosphor is easiest on the eyes. On most monitors, the phosphor will "flicker" to varying degrees. Check monitors for this tendency while you're shopping, as steady flickering can cause eyestrain. However, it should also be noted that too persistent an image can be annoying to the eye (it may linger longer than you'd like), and, worse, affect the accurate functioning of light pens.

With color monitors, all models are capable of displaying any color your computer can produce. But the *quality* of colors a given monitor can display differs. The distinctions between, say, different shades of red will vary from monitor to monitor, just as they do on color TVs. This is largely a function of a monitor's inner circuitry and parts, and it's usually reflected in the price tag. But price shouldn't be the only guide; look at monitors and compare the color quality.

BANDWIDTH: Measured in megahertz. The larger the video amplifier bandwidth, the sharper the edges of the image on the screen.

RESOLUTION: Describes the sharpness, clarity, and detail of a monitor's display. Usually measured in "pixels," or picture elements, both horizontally and vertically. The more pixels per square inch, the better the resolution.

Occasionally, resolution is measured by the number of horizontal lines available, as measured at the center of the screen. Again, the more "lines at center," the better the resolution. However, there's no point in buying a monitor with finer graphic resolution than your computer can support. The extra capability will just be wasted.

CHARACTER DISPLAY: Measured by the number of charac-

MODEL	BANDWIDTH	SCREEN SIZE/ COLOR	GRAPHICS RESOLUTION	CHARACTER DISPLAY	PRICE
Monochrome					
AMDEK V-300	18 MHz	12" green	900 × 800	80 × 24	\$179
AMDEK V-300A	18 MHz	12" amber	900 × 800	80 × 24	\$199
APPLE MIII	18 MHz	12" green	480 × 192	80 × 24	\$249
APPLE MIIIW	18 MHz	12" white	480 × 192	80 × 24	\$249
DYNAX GM120	20 MHz	12" green	600 lines	80 × 25	\$200
GORILLA HRG	22 MHz	12" green	800 lines	80 × 25	\$99
IBM MonoD.	16 MHz	11½" green	720 × 350	80 × 25	\$345
NEC JB1260M(A)	15 MHz	12" green	600 × 230	80 × 25	\$149
NEC JB1250A	15 MHz	12" amber	600 × 230	80 × 25	\$210
NEC JB1201M(A)	15 MHz	12" green	800 × 230	80 × 25	\$199
PANASONIC TR120MIP	20 MHz	12" green	1100 lines	80 × 25	\$220
PANASONIC TR120MPDA	20 MHz	12" amber	1100 lines	80 × 25	\$240
SAKATA SG1000	18 MHz	12" green	750 lines	80 × 25	\$129
SANYO DM5109CX	18 MHz	9" green	750 lines	80 × 24	\$200
TAXAN KG-12N-MN	18 MHz	12" amber	640 lines	80 × 25	\$189
USI PI-2	20 MHz	12" green	560 × 240	80 × 24	\$210
USI PI-3	20 MHz	12" amber	560 × 240	80 × 24	\$249
ZENITH VM121	15 MHz	12" green	700 lines	80 × 25	\$139
Composite Color					
AMDEK COLOR I	4 MHz	13" color	300 × 260	40 × 24	\$379
AMDEK COLOR I+	4 MHz	13" color	300 × 260	40 × 24	\$399
COMMODORE 1701	na*	13" color	320 lines	40 × 25	\$299
NEC JCL1212M(A)	na*	12" color	250 lines	40 × 25	\$399
PANASONIC CT-160	5 MHz	10" color/B&W	na*	40 × 25	\$400
SAKATA SC-100	18 MHz	13" color	300 × 280	40 × 25	\$329
SANYO DMC6013	6 MHz	13" color	270 lines	64 × 24	\$470
TI-PHA 4100	2.6 MHz	10" color	256 × 192	40 × 24	\$399
TAXAN 210	6 MHz	12" color	400 lines	40 × 24	\$399
Red-Green-Blue (RGB)					
ELECTROHOME ECM 1302	6 MHz	13" RGB	370 × 235	40 × 25	\$339
PRINCETON HX-12	15 MHz	11½" RGB	690 × 240	80 × 25	\$695
QUADRAM QUADCHROME	na*	12" RGB	690 × 480	80 × 25	\$795
TAXAN RGBVISION I	15 MHz	12" RGB	380 × 280	80 × 25	\$399
PANASONIC DT1300D	10 MHz	13" RGB/color	430 × 240	80 × 25 (RGB)	\$539
PANASONIC DT1000G	10 MHz	10" RGB	333 × 220	80 × 25	\$449
Combination					
MITSUBISHI AM1301	na*	13" TV/RGB/color	na*	80 × 25	\$600
SONY KX1901A	na*	19" RGB/color	500 × 350*	40 × 25	\$800
PANASONIC CT-1112	3.2 MHz	10" TV/color	300 × 230	40 × 25	\$379

*na means that manufacturer did not give these specifications.

A CLOSE-UP LOOK AT MONITORS

ters that can be displayed across the screen (horizontally) and the number of lines that can fit from top to bottom (vertically). Eighty-character displays are virtually a necessity for textual applications, such as word-processing, electronic-spreadsheet, and data-base-management work. Note that a monitor will display no more characters or lines than your computer is capable of displaying.

Note also that the bandwidth size, graphics resolution, and character display on all monochrome monitors are superior to those of color monitors.

PRICE: Manufacturer's suggested retail price. These prices are meant to serve as a general guide, not as gospel; they may vary considerably depending on region and type of retail outlet. ☐

How to ~~Have BE~~ the First Computer on Your Block

FIVE EASY STEPS TO THE MOST
UP-TO-THE MINUTE
HALLOWEEN
COSTUME AROUND

BY JOEY AND ELAINE LATIMER

Everyone knows computers are the rage this year. So this Halloween, computer costumes are bound to be a hit, too. Just for the fun of it, we've come up with an easy way to make one in an afternoon.

For our costume we chose the TRS-80 Model III computer, although any computer bought for home use and a TV monitor will do. The one-piece TRS-80 Model III (and the newer Model IV) were, however, what inspired us. We realized that an ordinary cardboard carton, with one flap held open, could, with some artistic flourishes, closely resemble this popular computer. After some racing of minds and careful thought we came up with a plan and a list of tools and supplies needed for the project.

JOEY LATIMER, an instructor at the Creative Computing Learning Center in San Marino, California, is a contributing editor to FAMILY COMPUTING. ELAINE LATIMER, who sings and writes songs and poetry, is a computer myopic now well on her way to recovery.



PHOTOGRAPHS BY STEPHEN McMANUS

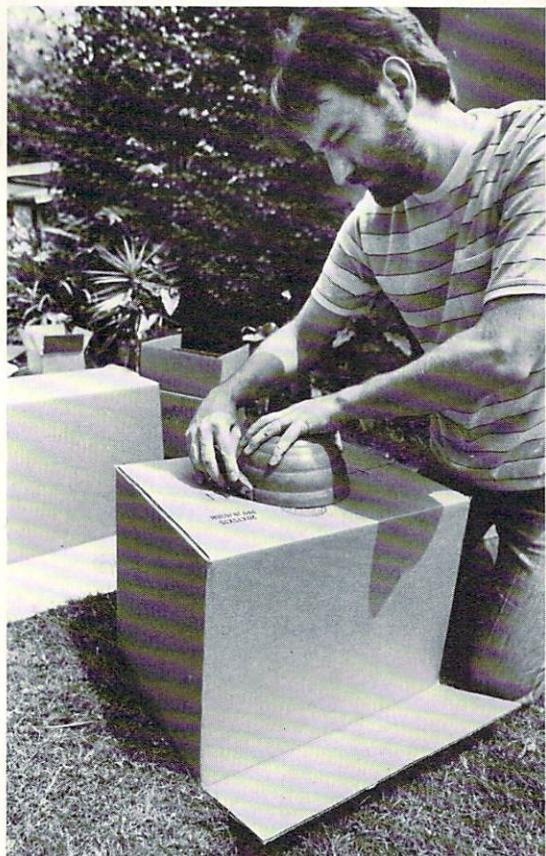
TOOLS AND SUPPLIES

Paint (we suggest water-based paint for easy cleanup)
Paint brushes (two or three different sizes)
Coffee cans and/or milk containers (to hold paint)
Old wooden spoon or stick (to stir paint)
Pliers (to cut and bend hanger)

Marking pens (for details and outlining)
Plate, bowl, or large can (to outline for head opening)
Scissors or carpet cutter (to cut hole for head)
Wire hanger (bent and taped to hold flap open)
Tape (packing or cellophane tape, not masking tape)



Here are the instructions, in five easy steps:
The first two should be carefully supervised or
performed by an adult. The remaining three
can be accomplished safely by a child.



Using a plate, bowl, or large can, and a marking pen, outline a circle on the top of the box as an opening for the head to fit through.



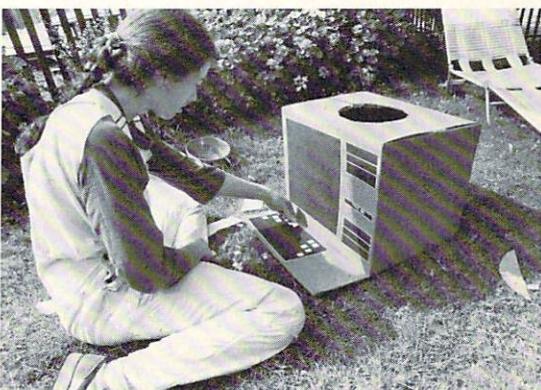
Twist open the wire hanger and, using pliers, cut the squiggly ends off. Now, bend the freshly cut ends toward the middle of the hanger until they meet. Hold the ends against the main shaft of the hanger and wrap tape thoroughly around both ends and the main shaft until the ends are no longer exposed. Make sure that there are enough layers of tape to provide a cushion and to ensure that there are no sharp edges on the costume.



Use the hanger to hold the box flap (computer keyboard) open. Do this by taping one half of the hanger to the underside of the keyboard flap, and the other half to the inside of the box (see photo). Once the hanger is taped in place, the keyboard flap can still be adjusted by bending the hanger.



Paint the entire box in a solid color. We mixed white paint with black, in milk containers and cans, to achieve a gray similar to that of the Model III. An old wooden spoon was used to mix the paint.



When the paint has dried, begin outlining and detailing your costume with marking pens, paint, stickers, glitter, or any other supplies you might have on hand. We used day-glow paint and silver-ink markers so that the costumes could be better seen at night. The TV screen or monitor can be decorated to look like a computer game, graphics, program listings, or anything imaginable. Don't be afraid to invent your own fantasy game. 

Portrait of a Computing Family

PART 2: THE CONNINGTONS TAKE THEIR COMPUTER ON A SHAKEDOWN CRUISE

BY NICK SULLIVAN

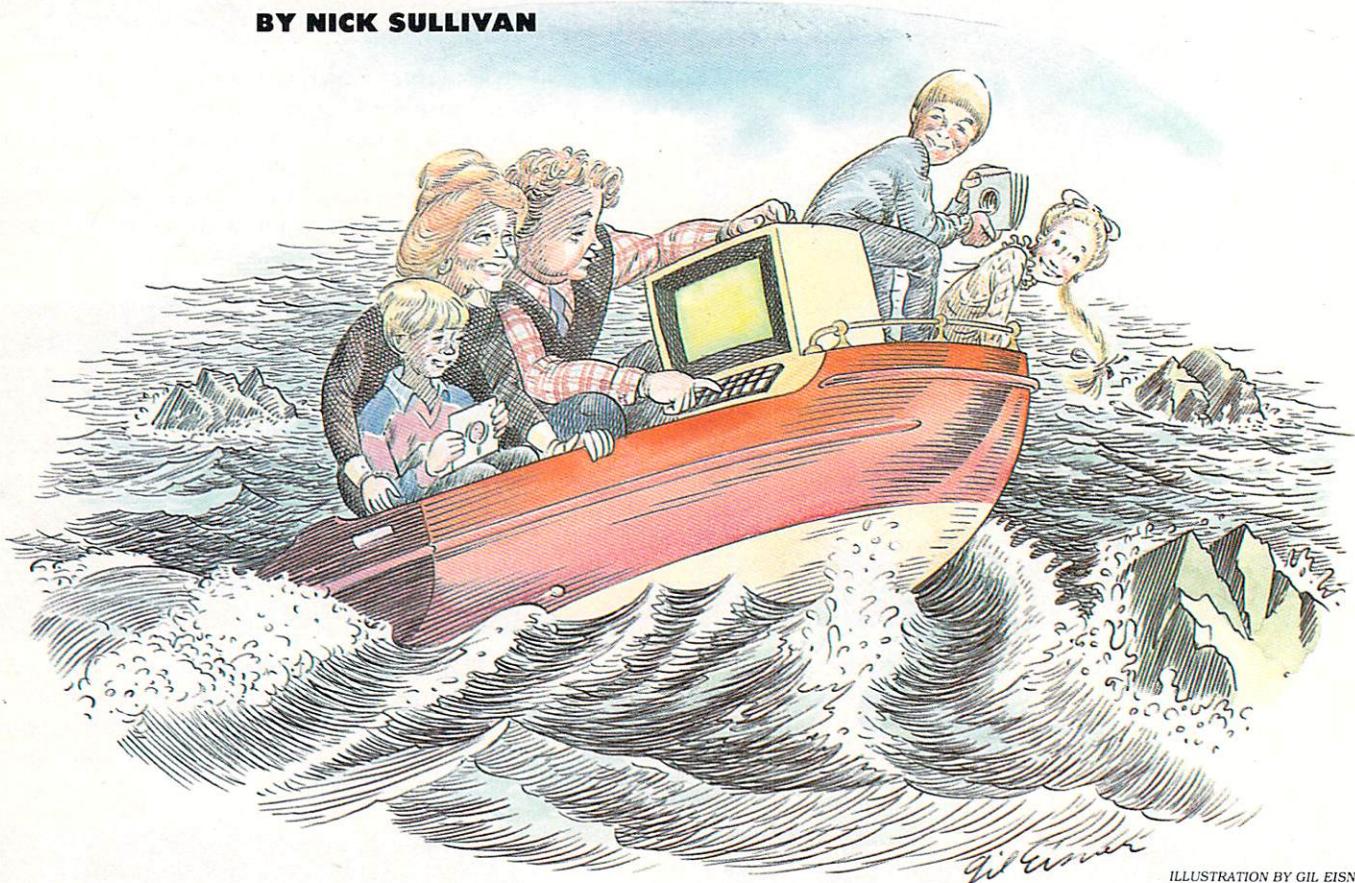


ILLUSTRATION BY GIL EISNER

New computer owners seem to go through four emotional stages. First, they're ecstatic. Then they're confused, and learn that they need more equipment and knowledge to make the machine work for them. The next stage is one of total involvement, as the computer's powers and potential uses seem to expand daily. Finally, the computer is viewed as a handy appliance, a tool used whenever it's needed.

The Conningtons are in the second stage of computer ownership—that is, confused. They've lived with a Commodore 64 for a few months (see "The Conningtons Buy a Computer" in the Premier issue), and are still waiting for the payoff. But they have approached their problems—which included a defective computer, difficulty finding reliable information, and a shortage of available software—with stoic patience. They've learned that they will have to work for the payoff.

The trouble began right after the Conningtons bought the computer. With the 64 hooked to the color TV, they tried to load and run some of the 200 cassette programs that had come with their computer. The programs, originally written for the Commodore PET, didn't work. Because they were still celebrating their purchase and hadn't carefully examined the manuals, the Conningtons figured the fault was theirs. They were wrong.

After a few frustrating weeks, during which the computer was moved to the boys' room (Tucker, age 13, and Chip, age 7), the Conningtons enlisted the aid of Tucker's math teacher, who also owned a Commodore 64. He declared the Connington's model a "lemon." The parents, Chuck and Maureen, took the C-64 back to Computer Strategies, the dealership where they had bought it, and were given a new computer. The programs worked.

"I'm glad we bought from a dealer," says Chuck. "We paid about \$100 more than we would have at a department or discount store, but got the 200 free programs, and somewhere to turn for help."

With the computer up and working, Chuck and Maureen went out to find software for the kids, as getting them comfortable with a computer was their primary goal.

NOW WHAT?

Chuck and Maureen visited several department and computer stores, but found precious little software for the C-64. A few games were available, but that was not why they had bought the computer. They had a solid collection of game cartridges for their Intellivision video game machine.

A salesperson at Toys "R" Us, one of their stop-offs, told them that all VIC-20 (also made by Commodore) software would run on the 64, but the Conningtons knew that wasn't true. Nevertheless, they gambled on a program called *Gortek and the Microchips*, which is designed to teach youngsters the routines of programming in BASIC, even though it was labeled a VIC-20 package. (*Gortek* has since been released in a Commodore 64 version.)

Gortek didn't work on the Conningtons' C-64. It ran up to a certain point, then collapsed. Chuck took it to the store and exchanged it for a new package. That didn't work either. So he made another trip and got his money back.

MICRO-EXPLORERS

Meanwhile, Tucker, Chip, and Janeen (age 11) were experimenting with the computer, keying in programs from the Commodore manual, and running the PET-designed educational and game programs. The kids produced some results from the Commodore manual—renditions of folk songs, and an example of the C-64's "sprite" graphics, which showed a balloonist flying across the screen over and over again. Now, if they could only add another balloonist, a few trees, and some music. . . . They were beginning to get an idea of the computer's potential.

But the work required for these small rewards was so great—often 10 minutes of keying in a program would elicit the response, ERROR IN LINE 20—that the children were beginning to use their Intellivision again. It was easier, and more gratifying. With the 64 hooked to a small black-and-white TV, they saw no colors and the contrast was fuzzy. Even more annoying was the slow loading time of the cassette recorder, which had the speed of a turtle in mid-summer.

INFORMATION, PLEASE

Chuck and Maureen were determined to pump new blood into the computer experiment before the children lost their patience. They called Computer Strategies to inquire about software. They learned that Commodore had

announced a new line of 64 software; 70 programs, including Commodore's version of LOGO and a data-base program called *The Manager*, were in the works.

This was the best news they'd had since they bought the computer. LOGO, a programming language used widely in schools, would give the kids a chance to advance their skills. And Chuck, who had in elementary school played basketball with Kareem Abdul Jabbar and now works as an assistant superintendent in Clarkstown's (New York) Department of Parks and Recreation, was particularly interested in *The Manager*. He thought it might allow him to keep track of field permits and team schedules.

At Computer Strategies, the Conningtons got the facts straight and simple: Most of Commodore's new line, including its LOGO and *The Manager*, was not yet ready. But other programs were available (some had to be mail ordered) from Commodore and third-party dealers. Most of these programs, and the others yet to come, would be on floppy disks.

This news, coupled with the Connington's annoyance at the cassette recorder's loading time, inspired them to upgrade their system. They bought a disk drive.

NEW LEASE ON LIFE

If the idea was to rekindle the kids' enthusiasm for computers, it worked. The computer and disk drive were moved from the boys' room to a small room that had been full of infants' toys. With a room of its own, the computer gained a more official status, and Janeen was more inclined to use it. The boys' room was not exactly her turf.

When Tucker undertook the Herculean task of transferring the kids' favorite PET programs from tape to disk, he increased their accessibility and use. "Watch how fast this disk drive works," says Tucker, with the air of a man who just traded in a crank-starter Ford for an electric-ignition model.

Chuck and Maureen (a part-time nurse) are caught up in their work and haven't spent much time with the computer, but Maureen is intent on taking courses this fall. This, she hopes, will goad her into using a machine she's somewhat wary of. Chuck points to a recent Art Buchwald column, which he says accurately describes Maureen's attitude. The column is entitled, "His Wife Sees No Advantage in Computers." Says Maureen: "Our main problem is that we don't have many people to turn to for help. You might say we're the first on the block with a computer."

Says Chuck: "We have no regrets about the computer. I just wish the dealer wasn't an hour away; or that we were a little closer to getting our merit badges." ■

If you're looking for information about computers, see "Eight Ways to Learn About Computers," on page 56.

**IF THE IDEA WAS
TO REKINDLE
THE KIDS'
ENTHUSIASM,
BUYING A DISK
DRIVE DID THE
TRICK.**

Eight Ways To Learn About Computers

OR . . . LIFE BEYOND A USER'S MANUAL

BY LORRAINE HOPPING

You can pay \$10 or \$1,000; you can spend one day, one month, or a year; and you can learn everything from operating a disk drive to advanced programming. Whatever the goal, computer users—from novices to experts—can access a wide range of courses, workshops, seminars, camps, fairs, materials, and other sources that offer computer instruction and guidance beyond the user's manual.

Some people wonder if it's wiser to take a course before or after they purchase a computer. If you take an introductory course to computers before you buy one, it can give you a good base of information to help determine why you might want a computer, how you could use it, and what to look for when shopping. Leroy Finkel, adviser to the Timbertech Computer Camp in Scotts Valley, California, disagrees: "Although you could take a course before you buy a computer, and it might help you figure out which computer to buy, I don't think it's the best approach. There are cheaper and easier ways to get that information. Buy your computer first, then take a short course that's specific to your machine."

Finkel cautions that those who really want to learn programming should expect to invest a lot of time. In a short course, he says, "You can learn a little programming, computer operations, and how to run software. You have to invest a minimum of 12 weeks, probably more, to become proficient in programming."

The amount of time and money you invest in computer training will depend largely on what you intend to accomplish. When considering courses, camps, or any program that promises to teach about computers, students should outline specific goals and learning objectives. You can then measure those objectives against what a course or camp has to offer and

the amount of commitment needed to complete the program.

Our guide is divided into two sections ("Computer Operations" and "Programming and Computer Applications") to offer suggestions for those who just want to learn how to turn on the computer and run a software program as well as those who want to advance their knowledge of programming.

COMPUTER OPERATIONS

Learning to operate a microcomputer should take only three to six hours of training. If you're lucky enough to have a computer expert in the neighborhood, he or she could show you how to assemble and operate a computer as you enjoy donuts and cider on a Sunday afternoon.

If you're the first on the block to own a computer, however, you might want to consider the following alternatives to depending entirely on the user's manual.

1. COMPUTER STORES

Don't expect a computer salesperson to teach you everything there is to know about computers in one easy lesson—at least not for free. Most computer stores offer a few hours of in-store instruction on fundamental computer operation; few stores go beyond.

One exception is the Radio Shack chain of stores. For \$49.95, you can get a 10-hour introduction to BASIC programming, specifically on Radio Shack models, and for \$99.95 you can get intermediate or advanced training in

BASIC. Check your local Radio Shack outlet for details, or write to Radio Shack/Tandy Corp., 1800 One Tandy Center, Fort Worth, TX 76102.

IBM is also planning in-store workshops on programming for its retail outlets across the country. For more information, contact System Products Division, IBM, P.O. Box 1328, Boca Raton, FL 33432.

Before you buy a computer, keep in mind that most department stores and other non-computer-dedicated stores offer little in the way of training services. Although you might find equipment at a discount, you may later have to invest extra money for a lesson or two in computer operation at a conference, workshop, or weekend course.

2. COMPUTER FAIRS

One way to learn about the various computer components and software programs and how to operate them is to read through books, magazines, company brochures, and other computer-related literature—a very time-consuming task.

A popular alternative is to put learning about computers and software into a carnival atmosphere, add thousands of fair patrons and vendors, and mix it all together into a giant fair—a computer fair to be exact.

"Computer fairs," says one savvy patron, "expose you to computing in general. You can get great bargains on hardware and software, see what the latest developments in the computer field are, and learn, for example, what a robot really looks like."

Computer fairs will not, however, turn you into a programmer or even teach you how to operate a computer or piece of software. Too many people and too few machines mean limited hands-on contact.

On the other hand, as more people use computers, fairs have begun to specialize by machine or type of user, thereby offering more in-depth coverage of one machine or one area of computing.

Now in its eighth year, the West Coast Computer Faire in San Francisco is one of the few national fairs appealing to all computer users. Fair patrons can expect to see a variety of software and hardware.

Information on next year's fair is available through Jim Warren, The West Coast Computer Faire, 345 Swett Rd., Woodside, CA 94062.

Northeast Exposition sponsors several general and specialized computer fairs. A few of their most popular include The National Computer Shows in New York, Boston, Minneapolis, and Denver, for all types of computer-users on all machines, and the PC '83 Fair for IBM Personal Computer—users (the next one is scheduled for Boston on October 4–6).

For information on these and other Northeast Exposition projects, write to Northeast Ex-



A computer fair is a good place to gather a lot of information at once.

position, 822 Boylston St., Chestnut Hill, MA 02167, or call toll-free (800) 841-7000.

3. RESORTS

It's now possible for the whole family to become computer literate while vacationing in the Bahamas or relaxing at a North Carolina tennis club. There are a variety of resorts that now offer computer instruction as part of the "recreational facilities."

You won't become an expert programmer overnight, but the relaxing atmosphere can help you overcome computerphobia and even entice you to write a simple program or two.

Club Med in particular has initiated computer programs at a number of its resorts, including those in the Bahamas, Italy, the West Indies, the Dominican Republic, and Mexico. Write to Club Med, 40 W. 57th St., New York, NY 10019, or call (800) 528-3100 for more information.



At Club Med, you can work on your programming skills while relaxing on vacation.

The Pinehurst Hotel and Country Club in Chapel Hill, North Carolina, is offering two-day computer literacy sessions for vacationers at the tennis and golf resort. Write to Learning at Pinehurst, P.O. Box 2328, Chapel Hill, NC 27514.

4. NONPROFIT ORGANIZATIONS

Of course you don't have to take your kids to the Bahamas to give them an opportunity to learn about computers. They can stay in the

Girl Scouts participating in a new computer program. Last year, more than 70,000 "Computer Fun" badges were distributed.



PHOTOGRAPH BY GIRL SCOUTS OF THE U.S.A.

neighborhood and earn a merit badge through their local Scout troop.

The Boy Scouts of America has set up a nationwide network of more than 300 Explorer Posts, many of which offer instruction in computer programming, data processing, and computer operation.

Typical Explorer Post projects, for boys and girls 14-to-20 years old, include writing programs, touring computer manufacturers or companies that use computers, and exploring computer careers.

Check with your local Boy Scout office or, if you are interested in setting up an Explorer Post in your area, write to The Explorer Division, The Boy Scouts of America, 1325 Walnut Hill Ln., Irving, TX 75062.

The Girl Scouts has revised its badge program for girls nine-to-14 years old to include a "Computer Fun" badge, and this past summer offered a computer camp session for both boys and girls. In order to earn the "Computer Fun" badge, Girl Scouts must complete six activities,

PHOTOGRAPH BY ERIN STEPHENSON



4-H leaders discuss the advantages of a computerized auction with a young club member.

such as using a calculator to project wages from a job, reading a science fiction book about computers or robots, and counting in binary.

Contact your local Girl Scouts Council or write to Girl Scouts of the U.S.A., 830 Third Ave., New York, NY 10022.

Several 4-H Clubs across the country have acquired microcomputers and are now sponsoring computer projects. One club in Maryland designed and built a robot that moves. Contact your local county 4-H extension agent or write the 4-H Extension Service of the U.S. Department of Agriculture in Washington, D.C. 20250.

The Boys Club of America is sponsoring a variety of computer programs at local affiliates. Many clubs also encourage members to attend computer camps and offer resource information on where to go.

PROGRAMMING AND COMPUTER APPLICATIONS

To get more than simple instruction in how to turn on a computer requires a serious commitment—of both time and money. Once again, the key to learning how to program or use computers in home, business, education, or recreation applications is to plan ahead. Sign up only for those courses or programs within your budget that will help you meet your computer objectives. If you just want to know 10 BASIC commands, a \$5.95 introductory book to BASIC will teach you. If, however, you want to learn structured programming in BASIC, a university course or computer camp might be easier and more tailored to your individual needs.

5. UNIVERSITIES

Taking computer courses at a nearby university doesn't have to mean spending a lot of money on tuition and working toward a computer science degree (although many summer courses are available for credit). Some universities and colleges offer two- to eight-week courses in hardware and software selection, programming in LOGO, BASIC, FORTRAN, PASCAL, or any number of languages, computer operations, and applications. Tuition can run from \$35 to \$2,400, depending on what the course includes and how much credit is offered.

6. ADULT EDUCATION CENTERS

Computer courses at adult education centers tend to be more business- and career-oriented than university classes. The most popular applications are data processing and word processing, although some centers specialize in all levels of programming. Courses range

from night or weekend workshops to eight- or 10-week intensive training programs and cost as little as \$100 or as much as \$4,000 or more for an advanced degree in programming.

If you simply want to familiarize yourself with computers, there are probably better alternatives; if you would like to learn practical computer applications, however, adult education centers are well worth investigating.

7. COMPUTER CAMPS

Summer may be barely over, but it's not too early to start planning for next year.

And if you long for the scent of pine trees and the itch of mosquito bites, don't think you're too old to be a camper. There are several computer camps that cater to families, so Mom and Dad can join in the fun.

In fact, there are now enough camps devoted to mixing sports fun with micro fun to fill a book. The *Computer Camp Book* offers advice on how to choose a camp and what you can expect to learn from one, and provides a comprehensive guide to computer camps in all areas and for all ages, including a few listings for family-oriented camps. It is available for \$12.95 plus \$2 postage from The Yellow Springs Computer Camp, 8327 Sheridan Ln., Eden Prairie, MN 55344; (612) 937-2066. [FAMILY COMPUTING is preparing a complete guide to computer camps—with a special emphasis on those that cater to families—for an upcoming issue.]

Jeff Howe, national director of camping for Computer Camps International, recommends that potential campers ask the following questions before signing up for a program, whether for a day camp or a two-month session.

What do you expect to gain from going to the computer camp?

Some camps emphasize recreation; others emphasize computer instruction; and others leave it up to the kids.

Can the camp supply a list of former camp members or their parents?

Howe suggests you call up two or more parents who have sent their kids to camp to get a candid opinion of the quality of instruction.

Which computers does the camp have?

If you own a VIC-20 and your child learns to program on a TI-99/4A, you might find yourself investing in additional courses or books to teach your child how to use his or her own computer. On the other hand, exposure to many different types of computers might be beneficial in the long run, as your child will probably encounter several brands over the years.

What is the background of the instructors?

While recreational camps often rely on high

school or college students to run sports programs, computer camps involve a much more complicated subject. Although students can be the best teachers, when computer training is offered they must be qualified to instruct, not just to baby-sit. And be sure to find out how many campers are assigned to each staffer.

Other questions parents should ask include: Does the camp have sufficient equipment? What is the percentage of time spent at the computer? What is the computer/camper ratio? Does the curriculum accommodate beginners and advanced students equally well? Does it build on previous knowledge so that campers don't waste time covering the same ground? What is the tuition on a per-day basis and what does it include?

8. COMPUTER MANUFACTURERS

The major computer companies offer home computer users various programs of instruction specific to their machines.

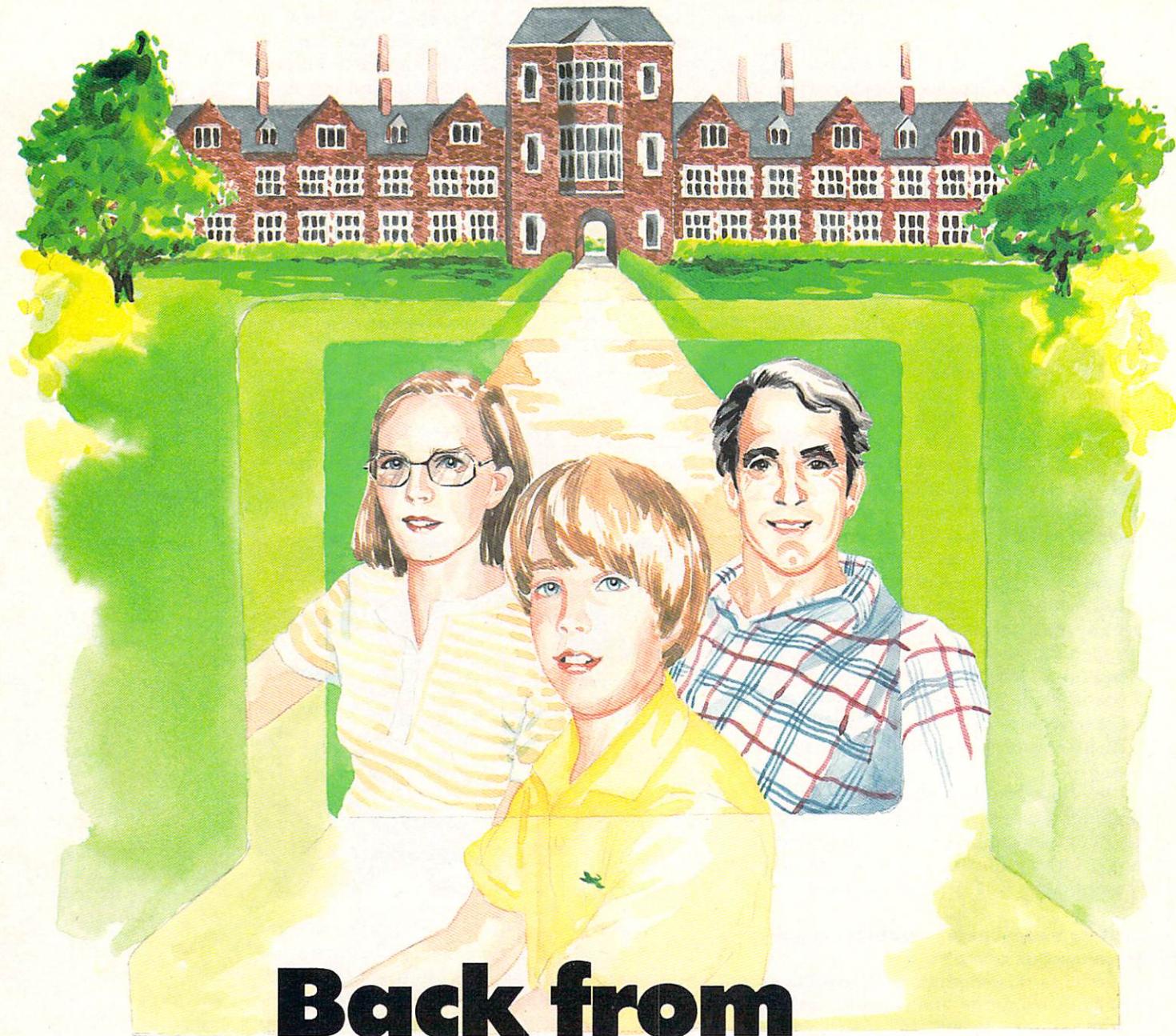


Learning at one of Atari's summer computer camps. Several other manufacturers also offer instructional sessions.

Atari runs two-, four-, and eight-week computer camps in Massachusetts, Pennsylvania, Maryland, North Carolina, Minnesota, and California throughout the summer. For more information, contact Atari Computer Camps, 40 E. 34th St., New York, NY 10016; (800) 847-4180. At Atari centers, now located only in Cupertino, California, and New York, but planned for other cities, families or individuals can learn BASIC programming, word processing, home management, and other applications on Atari 800 Computers. For \$30, customers can take the four-hour, computer-instructed course of their choice. For information call (408) 745-5107 in California.

IBM and Radio Shack offer computer instruction in their many retail outlets (see "Computer Stores") and some Apple dealerships offer workshops.

Texas Instruments has established several Family Learning Centers and Computer Advantage Clubs offering instruction on how to operate and program Texas Instruments computers. Write to Texas Instruments, Inc., P.O. Box 10508, MS 5849, Lubbock, TX 79408. 



Back from Family Computer Camp

BY DICK LUTZ

DICK LUTZ is a senior consultant with the international group of Logica companies, which provide management consulting in computing telecommunications and the new media.

SOME PEOPLE LEARN ABOUT COMPUTERS BIT BY BIT. OTHERS PREFER ONE LARGE BITE. THE WINTHROPS MADE THE SECOND CHOICE. HERE'S THE STORY OF WHAT THEY GOT FROM THE EXPERIENCE.

ILLUSTRATION BY MONA MARK

Pne quality that sets the Winthrop family, of Washington, D.C., apart from most other families interested in buying a computer is that they've always known why they were. Their family business—helping people manage their money intelligently and productively—very clearly was one that could only benefit from the addition of a computer.

With responsibility for the record-keeping part of the business, it seemed obvious to Phoebe-Jane that a computer could make her job easier. "I wanted to know if—and how—a computer might ease the task of records maintenance and computation," she says. "I was spending hours with a calculator, figuring and refiguring the numbers. If one number would change, all the totals would change. And that would change the summary sheet, and so on down. It was a horrendous job, unbelievably complicated."

When Phoebe-Jane Winthrop learned that Vassar College, which she had attended as an undergraduate, was offering a one-week computer course for Vassar alumni and their families and friends, she recognized an opportunity. Both she and her 10-year-old son, Dudley, could learn about computers at the same time. And the Winthrops would know if a computer really could enhance their family-run, home-based business in the ways they'd imagined.

Families all over the country are reaching similar conclusions about the best way to get their first major exposure to computers. These family programs now available all fall under the general "camp" umbrella, even though many of them are on college campuses, not campgrounds, and their offerings may not include any traditional camp activities. (See "Eight Ways To Learn About Computers" in this issue of FAMILY COMPUTING for more information about computer camps.)

Phoebe-Jane arrived back at the Vassar campus with her son in one hand, sample documents prepared for the Winthrop business in the other, and a load of hopes that she'd learn to write BASIC programs to eliminate some of the repetitious aspects of her work.

Along with Phoebe-Jane and Dudley were 73 other "campers." The children ranged from five years old to 16, with most falling in the middle. That the majority of adults were women was no surprise, since Vassar was exclusively a women's school for most of its history. The large female enrollment, though, was unusual for a computer course.

Togetherness for children and parents would end when the day's instruction began. The youth group and the adults each had their turn in the lab, equipped with 25 TRS-80s on loan from Radio Shack, as well as a number of other brands, including Commodore 64s, Apples, Zeniths, and IBMs. Most adults stayed in the general computer-literacy track taught by Professor William Pritchard, the program coordinator. In addition to the class for the youth

group, there was one for adults who wanted to concentrate on BASIC.

While the program covered three of the most obvious computer applications, for Phoebe-Jane the week was full of surprises. "Word processing was first. I had a general concept of word processing, but to me it was something they have on their desks at the *Washington Post*, not something you'd have in your home. I knew you could delete things and move things around, but I really had no feeling for what it's like to sit down at the keyboard and how easily it can be done, especially if you know how to type." Within a short time, she had typed a letter in the memory of a TRS-80. "It was just amazing—the freeing of barriers to thought. And how you can be very fussy if you want, and make corrections over and over."

Applications for the Winthrop business were obvious. Phoebe-Jane's husband, Beekman, seeks out the best financial and legal advisers for his clients and writes regular reports that demystify the world of personal investment and philanthropy, taxes and expense control. It didn't take much imagination to figure out how much easier word processing would make the job of report writing.

"Then spreadsheets. That was a moment when a light went on—"Aha!" I could see immediately the concept of how the *SuperCalc* software program would extend our capability for working through the numbers.

"And then BASIC." Phoebe-Jane and one or two others in the general computer-literacy track took to computing so readily that they crossed over to the BASIC programming group. For about half the week, they did the work of both groups, sometimes keeping the instructors at the computer lab late into the evening. "I found the logic and discipline required to master programming exciting. To a puzzle addict, programming BASIC is just one more brainteaser."

Like a lot of her classmates, Phoebe-Jane found this second time at college a lot different from her first. As an undergraduate she'd had less than clear direction to her studies. So she worried about her ability to return to an academic situation after all those years and not goof off as she had previously. "It's a kind of educational experience I haven't had before. All through the week, I had a feeling of something momentous happening." It didn't matter that she never managed to program a simple financial analysis, which she'd hoped to do.

In programming it was Dudley and the rest of the youth group who starred. At the end of the week, they held a mini-festival to show off their programs to the adults. An added benefit was the broad perspective on computers that Dudley came home with. "Before we went," he says, "it seemed like computers were going to take over the world. Now I know that people who talk like that don't really know what they're saying. Now I know what computers can do and what they can't do."

**"ALL THROUGH
THE WEEK I HAD
A FEELING OF
SOMETHING
MOMENTOUS
HAPPENING."**

Going from computer curiosity through computer literacy to computer mastery isn't the story of just one short week at family computer camp, as crucial as that experience was. Because, while Phoebe-Jane and Dudley both came home excited about computers, the family waited seven long months before buying.

"For one thing, we were indoctrinated at Vassar in how to be wise consumers. It was clear we just couldn't rush into a computer store and say, 'I'll take one.' The lesson about buying carefully had taken root. 'I realized,' says Phoebe-Jane, 'that making the right purchase would take a lot of study and a lot of shopping. And I didn't have the time. I was too busy doing the very things that we needed the computer to help with. 'And then there was the problem of justification. I came back knowing that we would use a machine in three ways: word processing, spreadsheet analysis, and writing BASIC programs. And I knew it would save lots of secretarial time and accounting work—calculations in particular. But we weren't paying a secretary at the time. Or an accountant. I was doing it. Even so, it was clear we were probably going to have to hire some accounting and secretarial help soon. It was getting to be too much.'

Early this year, without a computer, Beekman Winthrop was facing a deadline on a 30-page report. He began talking about buying a dedicated word processor, which would be limited to a single function. Suddenly, there was no longer any problem of justifying the purchase of a computer. 'I thought, 'Wait a minute,'" says Phoebe-Jane. "You don't go out and get a word processor when what we really want is a computer that will do everything else, too." So acquiring a computer became a priority, with the report deadline acting as a kind of zero-point in a countdown.

Here's where the lessons learned during the week at computer camp really paid off. Following the advice of Vassar's Professor Pritchard, the Winthrops discussed their software requirements at length. There was also some investigation of hardware and software options. At one point, in fact, Phoebe-Jane actually ordered a Victor 9000. "It was expensive—over \$6,000—but its versatility made it a bargain compared with what a dedicated word processor could cost us." That sale fell apart when the retailer couldn't supply a cable to connect the machine to a lower cost printer she had selected to drive the total price down. It would have to be special-ordered, and promises about a delivery date were too vague.

"So Beekman went off to Computerland. He saw the IBM-PC, and he called and said it looked as though it could do everything we needed. We thought about it for a while, and, aware of all the software options for the PC, we ordered." The excitement started all over again.

Asked "roughly when" the Winthrops acquired their IBM-PC, Phoebe-Jane answers un-

hesitatingly: "February 17. It's a date we'll celebrate, like an anniversary." Bringing the computer home turned life upside down. "It was a lot like falling in love, when you lose your appetite and get all keyed up and you think of nothing else but. Supper was a disaster a number of days. I knew it was ready when I smelled the spinach burning. And I had the impression that when Dudley came home from school he was ready to scream because he felt abandoned for a while. I almost resented the fact that people had to eat. It got to the point where the pets were coming upstairs and throwing up on the rug just to get noticed."

Dudley, uncharacteristically patient for a 10-year-old, has eventually gotten his share of time on the computer. He's now writing a play with his friend Teddy Hall. "Dudley's always been interested in drama," says his mother, "but the computer has made a difference."

Dudley agrees. "It's so easy, because if you make a mistake you just type over it. So what you get when you're finished is perfect."

That single quality of a computer-based word processor won the adult Winthrop hearts immediately. Beekman's 30-page report, a meticulous examination of one client's financial position, was clerically flawless, unlike anything they'd produced before. "It was perfect," Beekman remembers.

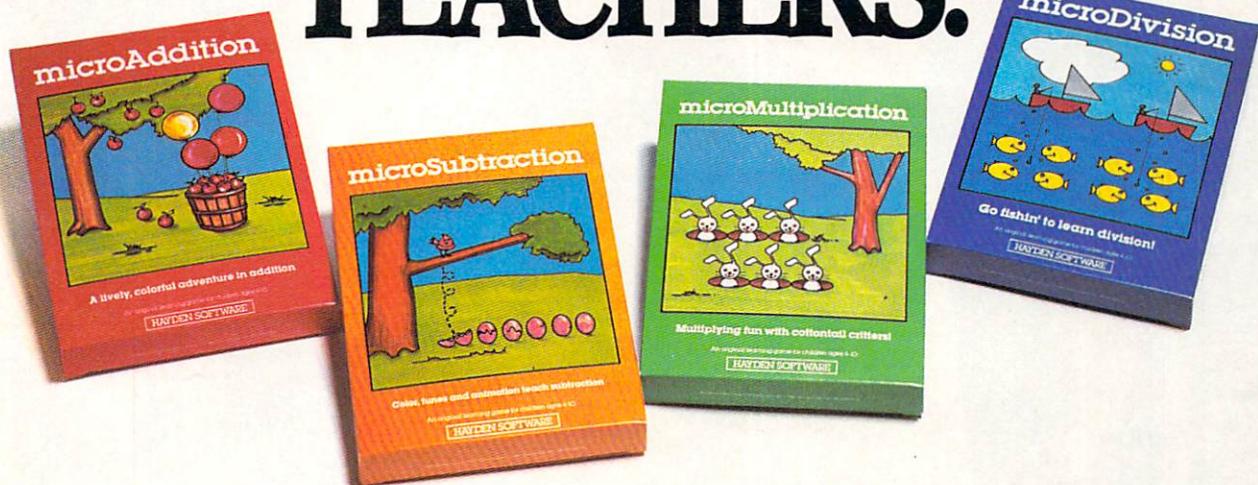
And the spreadsheet analysis has other financial professionals saying they'd "like to see that computer," as though the IBM-PC were a secret weapon in the Winthrop basement. The secret weapon, of course, is not so much the machine, or even the *SuperCalc* software, as it is the ability to thoroughly grasp the analytical problem at hand, and the ability to program it into *SuperCalc*'s array of automated rows and columns of numbers. A series of individual sheets interlock, producing a detailed but comprehensible analysis of a client's financial position. Once the system is thought through and the *SuperCalc* programmed, the computer does the tedious arithmetic.

Phoebe-Jane's facility with the spreadsheet program is apparent when, in a few minutes, she generates a sample portfolio analysis sheet for a fictional Richard B. Snodgrass. It's a form which can be used again and again for investors, with *SuperCalc* doing all the adding and multiplying.

"This system is good. So good that I think it would really be a shame not to share it with others," Phoebe-Jane states. As yet there are no plans along those lines, but the Winthrops are thinking about it. Phoebe-Jane's *SuperCalc* templates could be sold on a disk, perhaps along with a manual on how to use them. But that will have to wait until the system is thoroughly developed, fully tested in practice, and completely debugged. Meanwhile, the Winthrops are one American family whose life, and the way they look at the rest of the world, has changed forever. And it started with just a single week at computer camp. □

"THE PETS WERE COMING UPSTAIRS AND THROWING UP ON THE RUG JUST TO GET NOTICED."

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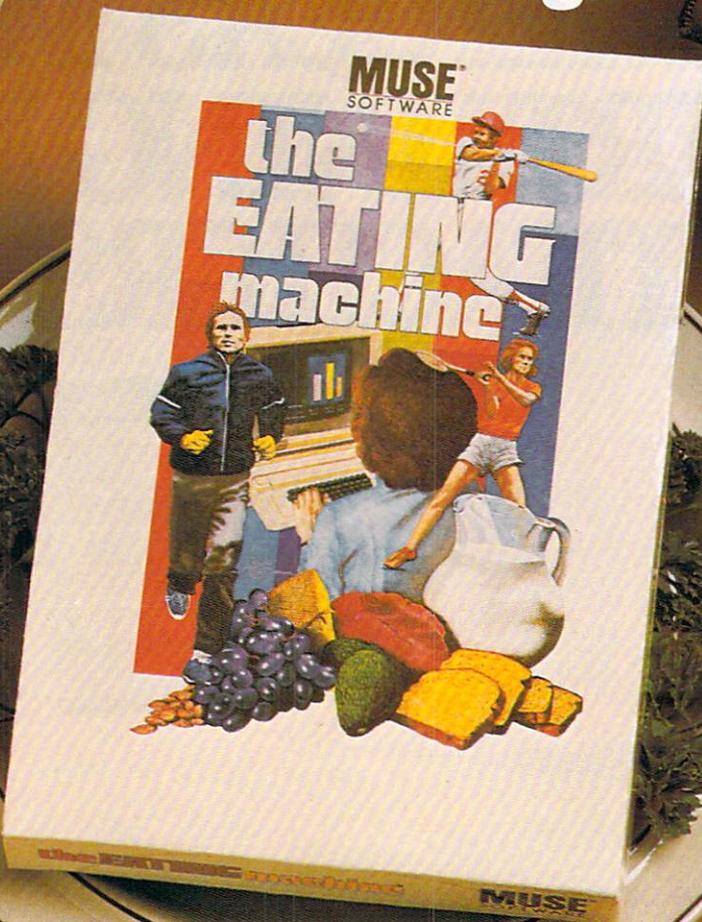
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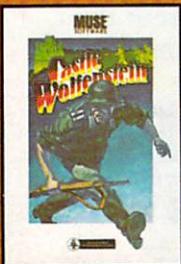
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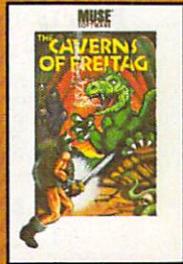
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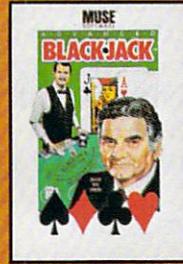
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★ OCTOBER ★

BEGINNER PROGRAMS

Pages 66 to 73

Some treats from our house to yours that will surprise the whole neighborhood Halloween night.

PUZZLE

Pages 74 to 77

Dracula's Family Tree—a computerized puzzle to sink your teeth into and get your blood boiling.

READER-WRITTEN PROGRAMS

Pages 80 to 84

A running diary program that the speediest jogger can't pass by; and a snakey program that even ophidiophobics will love.

ILLUSTRATION BY JIM CHERRY III

Cherry

BEGINNER PROGRAMS**JACK-O'-LANTERN****BY JOEY LATIMER**

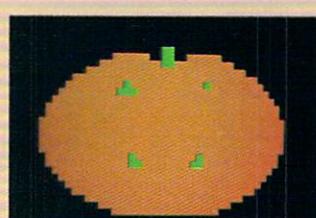
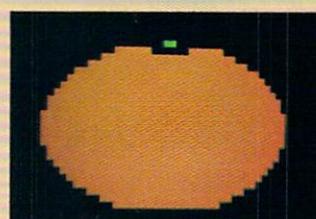
Throw out your Swiss army knife; this Halloween you can carve a pumpkin with a cursor! That's right: just type this program into your computer, run it, and your computer will create a *Jack-o'-Lantern* right on your screen! Put the monitor in your front window, and watch your pumpkin be the talk of the neighborhood on Halloween night!

Apple/Jack-o'-Lantern

```

10 GR : COLOR= 9
20 HLIN 11,16 AT 2
30 FOR Z = 2 TO 39
40 READ X: READ Y
50 HLIN X,Y AT Z
60 NEXT Z
70 COLOR= 13
80 PLOT 13,9: PLOT 25,9
90 FOR Z = 10 TO 13
100 READ X: READ Y
110 HLIN X,Y AT Z
120 READ X: READ Y
130 HLIN X,Y AT Z
140 NEXT Z
150 PLOT 19,18
160 FOR Z = 19 TO 22
170 READ X: READ Y
180 HLIN X,Y AT Z
200 NEXT Z
210 FOR Z = 27 TO 30
220 READ X: READ Y
230 HLIN X,Y AT Z
240 NEXT Z
250 COLOR= 8
260 FOR Z = 0 TO 4
270 HLIN 18,20 AT Z
280 NEXT Z
290 HOME : GOTO 290
300 DATA 22,27,9,29,8,31,7,32,6,33,5,34,4,34
,4,35,3,36,2,37,2,37,1,38,1,38,0,39
310 DATA 0,39,0,39,0,39,0,39,0,39,0,39,
1,38,1,38,2,37,2,37,2,37,3,36,3,36
320 DATA 4,35,5,35,6,34,7,34,8,33,9,32,11,31
,12,29,14,27,15,24
330 DATA 12,14,24,26,11,15,23,27,10,16,22,28
,9,17,21,29
340 DATA 18,20,17,21,16,22,15,23
350 DATA 12,26,13,25,14,24,15,23

```

**Atari/Jack-o'-Lantern**

```

10 PRINT CHR$(125)
20 GRAPHICS 3+16
30 COLOR 1
40 FOR R=1 TO 24
50 READ X,Y,X1,Y1
60 PLOT X,Y
70 DRAWTO X1,Y1
80 NEXT R
90 COLOR 2
100 FOR R=1 TO 14
110 READ X,Y
120 PLOT X,Y
130 NEXT R

```

```

140 FOR R=1 TO 13
150 READ X,Y,X1,Y1
160 PLOT X,Y
170 DRAWTO X1,Y1
180 NEXT R
190 GOTO 190
200 DATA 11,1,16,1,23,1,28,1,9,2,30,2,7,3,32,
3,5,4,34,4,4,5,35,5,3,6,36,6,2,7,37,7,38,8,1,
8,1,9,38,9
210 DATA 39,10,0,10,0,11,39,11,39,12,0,12,0,1
3,39,13,39,14,0,14,1,15,38,15,38,16,1,16,2,17
,37,17,36,18,3,18
220 DATA 4,19,35,19,34,20,5,20,7,21,32,21,30,
22,9,22,11,23,28,23
230 DATA 19,0,20,0,19,1,20,1,19,2,20,2,13,5,2
6,5,14,15,25,15,14,16,15,16,24,16,25,16
240 DATA 12,6,14,6,25,6,27,6,11,7,15,7,24,7,2
8,7,10,8,16,8,23,8,29,8,19,11,20,11,18,12,21,
12,17,13,22,13
250 DATA 14,17,25,17,15,18,24,18,16,19,23,19,
17,20,22,20

```

Commodore 64/Jack-o'-Lantern

```

10 PRINT CHR$(147)
20 POKE 53281,0: POKE 53280,0
30 FOR Z = 1 TO 24
40 READ X: READ Y
50 FOR P = X TO Y
60 POKE P,160
70 POKE P+54272,8
80 NEXT P
90 NEXT Z
100 FOR Z = 1 TO 15
110 READ X: READ Y
120 FOR P = X TO Y
130 POKE P,160
140 POKE P+54272,7
150 NEXT P
160 NEXT Z
170 FOR Z = 1 TO 2
180 READ X: READ Y
190 FOR P = X TO Y
200 POKE P,160
210 POKE P+54272,9
220 NEXT P
230 NEXT Z
240 GOTO 240
250 DATA 1078,1090,1114,1134,1151,1176,1189,
1218,1228,1259
260 DATA 1267,1300,1306,1341,1345,1382,1385,
1422,1424,1463
270 DATA 1464,1503,1504,1543,1544,1583,1584,
1623,1624,1663
280 DATA 1665,1702,1706,1742,1747,1781,1788,
1820,1829,1859
290 DATA 1871,1898,1912,1936,1954,1974,1996,
2012
300 DATA 1237,1237,1250,1250,1276,1278,1289,
1291
310 DATA 1315,1319,1328,1332,1354,1360,1367,
1373
320 DATA 1483,1484,1522,1525,1561,1566
330 DATA 1678,1689,1719,1728,1760,1767,1801,
1806
340 DATA 1043,1044,1083,1084

```

VIC-20/Jack-o'-Lantern

```

10 PRINT CHR$(147)
20 POKE 36879,136
30 FOR Z=1 TO 25
40 READ X: READ Y
50 FOR P=X TO Y
60 POKE P,160
70 POKE P+30720,0
80 NEXT P
90 NEXT Z

```

```

100 FOR Z=1 TO 12
110 READ X: READ Y
120 FOR P=X TO Y
130 POKE P,160
140 POKE P+30720,7
150 NEXT P
160 NEXT Z
170 GOTO 170
180 DATA 7680,7689,7692,7701,7702,7707,7718,
7723,7724,7727
190 DATA 7742,7745,7746,7748,7765,7767,7768,
7770,7788,7789
200 DATA 7790,7791,7811,7811,7812,7812,7833,
7833,7834,7834
210 DATA 8076,8076,8097,8097,8098,8098,8119,
8119,8120,8121
220 DATA 8140,8141,8142,8144,8161,8163,8164,
8168,8181,8185
230 DATA 7797,7797,7804,7804,7818,7820,7825,
7827
240 DATA 7839,7843,7846,7850,7910,7911,7931,
7934
250 DATA 7952,7957,8039,8046,8062,8067,8085,
8088

```

TI-99/4A/Jack-o'-Lantern

```

10 CALL CLEAR
20 CALL SCREEN(2)
30 A$="oooooooooooo"
40 CALL CHAR(96,A$)
50 CALL CHAR(104,A$)
60 CALL CHAR(112,A$)
70 CALL COLOR(9,10,1)
80 FOR R=1 TO 23
90 READ X,X1,Y
100 FOR P=X TO X1
110 CALL HCHAR(Y,P,96)
120 NEXT P
130 NEXT R
140 CALL COLOR(10,7,1)
150 FOR R=1 TO 6
160 READ X,Y
170 CALL HCHAR(Y,X,104)
180 NEXT R
190 CALL COLOR(11,12,1)
200 X=11
210 Y=7
220 X1=X
230 FOR P=1 TO 4
240 FOR O=X TO X1
250 CALL HCHAR(Y,O,112)
260 CALL HCHAR(Y,O+11,112)
270 CALL HCHAR(Y+5,O+5,112)
280 NEXT O
290 Y=Y+1
300 X=X-1
310 X1=X1+1
320 NEXT P
330 X=12
340 Y=18
350 X1=21
360 FOR P=1 TO 3
370 FOR O=X TO X1
380 CALL HCHAR(Y,O,112)
390 NEXT O
400 Y=Y+1
410 X=X+1
420 X1=X1-1
430 NEXT P
440 GOTO 440
450 DATA 11,23,2,9,25,3,7,27,4,6,28,5,4,29,6,
3,30,7,2,31,8,1,32,9,1,32,10,1,32,11
460 DATA 1,32,12,1,32,13,1,32,14,2,31,15,2,31
,16,3,30,17,3,30,18,4,29,19,5,28,20
470 DATA 6,26,21,7,25,22,9,23,23,12,20,24
480 DATA 16,1,17,1,16,2,17,2,16,3,17,3

```

Timex Sinclair 1000/Jack-o'-Lantern

```

10 CLS
20 LET E = 21
30 FOR A = 2.5 TO 90 STEP 2.5
40 LET R = A/180 * PI
50 LET S = SIN R * 25
60 LET C = INT (COS R * 21)
70 IF C = E THEN GOTO 150
80 LET Y = 20 + C
90 LET Z = 21 - C
100 FOR X = (30-S) TO (30+S)
110 PLOT X,Y
120 PLOT X,Z
130 NEXT X
140 LET E = C
150 NEXT A
160 FOR Y = 1 TO 5
170 FOR X = Y TO (10-Y)
180 UNPLOT (X+14),(Y+28)
190 UNPLOT (X+35),(Y+28)
200 UNPLOT (X+25),(Y+20)
210 NEXT X
220 NEXT Y
230 FOR Y = 11 TO 14
240 FOR X = (34-Y) TO (26+Y)
250 IF (X>27) AND (X<32) THEN PLOT X,(Y+29)
260 UNPLOT X,Y
270 NEXT X
280 NEXT Y
290 SLOW
300 PRINT AT 0,0," "
310 GOTO 310

```

TRS-80 Color Computer/Jack-o'-Lantern

```

10 CLS()
20 FOR Y = 2 TO 29
30 P = 1
40 IF Y > 6 AND Y < 12 THEN P = 3
50 IF Y > 13 AND Y < 26 THEN P = 2
60 FOR L = 1 TO P
70 READ B,E
80 FOR X = B TO E
90 SET (X,Y,B)
100 NEXT X
110 NEXT L
120 NEXT Y
130 FOR Y = 0 TO 3
140 FOR X = 30 TO 33
150 SET (X,Y,1)
160 NEXT X
170 NEXT Y
180 GOTO 180
190 DATA 20,43,16,47,13,50,10,53,9,54,8,19
200 DATA 23,40,44,55,7,18,24,39,45,56,6,17
210 DATA 25,38,46,57,6,16,26,37,47,57,6,15,27
220 DATA 36,48,57,4,59,4,59,4,31,34,59,4,30
230 DATA 35,59,4,29,36,59,4,28,37,59,4,30,31
240 DATA 59,6,30,31,57,6,30,31,57,6,19,44,57
250 DATA 7,20,43,56,8,21,42,55,9,22,41,54
260 DATA 10,23,40,53,10,53,11,52,13,50,17,46

```

TRICK OR TREAT

BY JOEY LATIMER

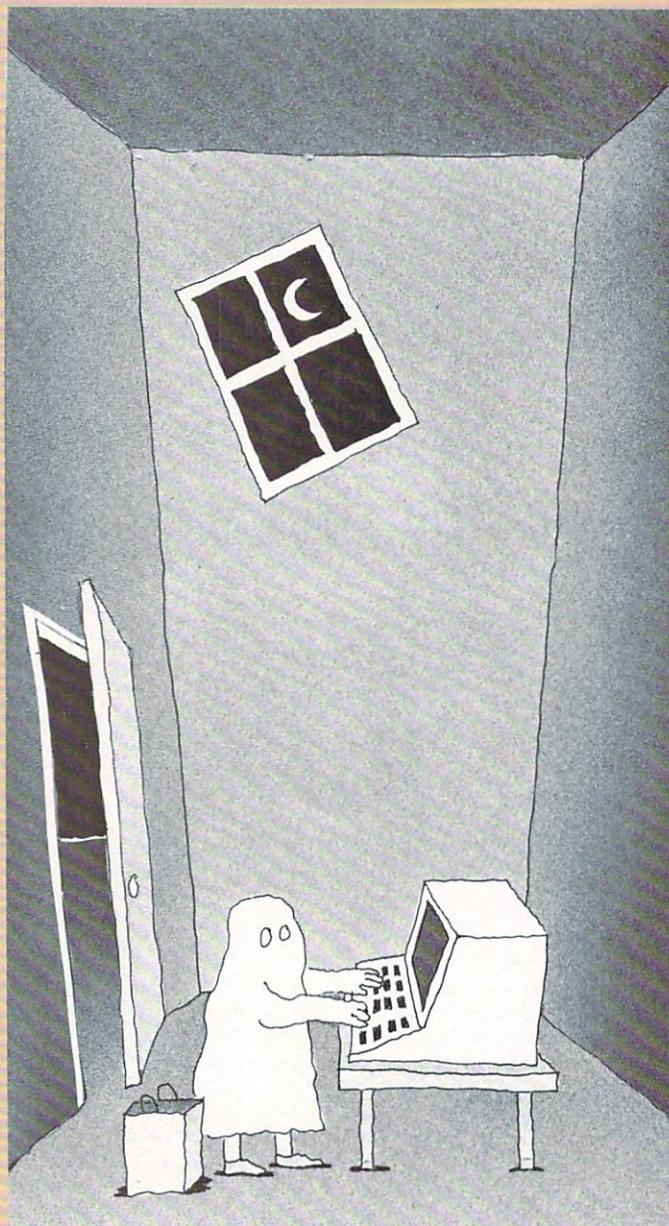


ILLUSTRATION BY JOSH GOSFIELD

It's Halloween night and you find yourself without an edible treat in the house. Computer owners, you can trick the kids with a treat sweeter to children than any candy. Turn to your computer, type in our *Trick or Treat* program,

move the computer into your foyer, and you and your computer will be ready when the goblins and witches come to call.

(Be sure to set your computer for all uppercase letters before running the program.)

Apple/Trick or Treat

```

20 HOME
30 PRINT "HI! WHAT IS YOUR NAME?"
40 PRINT "(PLEASE PRESS THE"
50 PRINT " RETURN KEY AFTER"
60 PRINT " EACH REPLY.)"
70 PRINT
80 PRINT "MY NAME IS ";
90 INPUT N$
100 HOME
110 PRINT "TELL ME, ";N$; ","
120 PRINT "WHAT IS YOUR COSTUME?"
130 PRINT
140 PRINT "I AM ";
150 INPUT C$
160 HOME
170 PRINT "I'VE ALWAYS WANTED"
180 PRINT "TO BE ";C$; ", TOO!"
190 PRINT "BUT I'M STILL HAPPY"
200 PRINT "BEING A COMPUTER."
210 GOSUB 1000
220 PRINT
230 PRINT "WHAT IS YOUR FRIEND"
240 PRINT "DRESSED UP AS?"
250 PRINT
260 PRINT "MY FRIEND IS ";
270 INPUT F$
280 HOME
290 PRINT F$; " AND"
300 PRINT C$; "."
310 PRINT "WHAT A PAIR!"
320 GOSUB 1000
330 PRINT
340 PRINT "TYPE THE SECRET WORD"
350 PRINT "TO GET A TREAT."
360 PRINT "(HINT: OOB)"
370 INPUT W$
380 IF W$ = "BOO" THEN 420
390 HOME
400 PRINT "THAT'S NOT IT, ";N$; "."
410 GOTO 330
420 HOME
430 FOR T = 1 TO 60
440 PRINT "          HAPPY HALLOWEEN";
450 FOR X = 1 TO 75
460 NEXT X
470 NEXT T
480 HOME
490 PRINT "GOODBYE --"
500 PRINT "SEE YOU NEXT YEAR!"
510 GOSUB 1000
520 GOTO 20
1000 FOR D = 1 TO 1750
1010 NEXT D
1020 RETURN

```

Atari/Trick or Treat

```

10 DIM N$(20),C$(20),F$(20),W$(20)
20 PRINT CHR$(125)
30 PRINT "HI! WHAT IS YOUR NAME?"
40 PRINT "(PLEASE PRESS THE"
50 PRINT " RETURN KEY AFTER"
60 PRINT " EACH REPLY.)"
70 PRINT
80 PRINT "MY NAME IS ";
90 INPUT N$
100 PRINT CHR$(125)
110 PRINT "TELL ME, ";N$; ","
120 PRINT "WHAT IS YOUR COSTUME?"
130 PRINT
140 PRINT "I AM ";
150 INPUT C$
160 PRINT CHR$(125)
170 PRINT "I'VE ALWAYS WANTED"
180 PRINT "TO BE ";C$; ", TOO!"
190 PRINT "BUT I'M STILL HAPPY"
200 PRINT "BEING A COMPUTER."

```

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by Brian Wagner

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BEGINNER PROGRAMS

```
210 GOSUB 1000
220 PRINT
230 PRINT "WHAT IS YOUR FRIEND"
240 PRINT "DRESSED UP AS?"
250 PRINT
260 PRINT "MY FRIEND IS ";
270 INPUT F$
280 PRINT CHR$(125)
290 PRINT F$;" AND"
300 PRINT C$;"."
310 PRINT "WHAT A PAIR!"
320 GOSUB 1000
330 PRINT
340 PRINT "TYPE THE SECRET WORD"
350 PRINT "TO GET A TREAT."
360 PRINT "(HINT: OOB)"
370 INPUT W$
380 IF W$="BOO" THEN 420
390 PRINT CHR$(125)
400 PRINT "THAT'S NOT IT, ";N$;"."
410 GOTO 330
420 PRINT CHR$(125)
430 FOR T=1 TO 40
440 PRINT "      HAPPY HALLOWEEN";
450 FOR X=1 TO 30
460 NEXT X
470 NEXT T
480 PRINT CHR$(125)
490 PRINT "GOODBYE --"
500 PRINT "SEE YOU NEXT YEAR!"
510 GOSUB 1000
520 GOTO 20
1000 FOR D=1 TO 1500
1010 NEXT D
1020 RETURN
```

TI-99/4A/*Trick or Treat*

```
20 CALL CLEAR
30 PRINT "HI! WHAT IS YOUR NAME?"
40 PRINT "(PLEASE PRESS THE"
50 PRINT " ENTER KEY AFTER"
60 PRINT " EACH REPLY.)"
70 PRINT
80 PRINT "MY NAME IS ";
90 INPUT N$
100 CALL CLEAR
110 PRINT "TELL ME, ";N$;",";
120 PRINT "WHAT IS YOUR COSTUME?"
130 PRINT
140 PRINT "I AM ";
150 INPUT C$
160 CALL CLEAR
170 PRINT "I'VE ALWAYS WANTED"
180 PRINT "TO BE ";C$;"; TOO!"
190 PRINT "BUT I'M STILL HAPPY"
200 PRINT "BEING A COMPUTER."
210 GOSUB 1000
220 PRINT
230 PRINT "WHAT IS YOUR FRIEND"
240 PRINT "DRESSED UP AS?"
250 PRINT
260 PRINT "MY FRIEND IS ";
270 INPUT F$
280 CALL CLEAR
290 PRINT F$;" AND"
300 PRINT C$;"."
310 PRINT "WHAT A PAIR!"
320 GOSUB 1000
330 PRINT
340 PRINT "TYPE THE SECRET WORD"
350 PRINT "TO GET A TREAT."
360 PRINT "(HINT: OOB)"
370 INPUT W$
380 IF W$ = "BOO" THEN GOTO 420
390 CLS
400 PRINT "THAT IS NOT IT, ";N$;"."
410 GOTO 330
420 CLS
430 FOR T = 1 TO 35
440 PRINT "      HAPPY HALLOWEEN";
470 NEXT T
480 CLS
490 PRINT "GOODBYE --"
500 PRINT "SEE YOU NEXT YEAR..."
510 GOSUB 1000
520 GOTO 20
1000 FOR D = 1 TO 100
1010 NEXT D
1020 RETURN
```

```
440 PRINT "      HAPPY HALLOWEEN";
450 FOR X=1 TO 25
460 NEXT X
470 NEXT T
480 CALL CLEAR
490 PRINT "GOODBYE --"
500 PRINT "SEE YOU NEXT YEAR!"
510 GOSUB 1000
520 GOTO 20
1000 FOR D=1 TO 1500
1010 NEXT D
1020 RETURN
```

Timex Sinclair 1000/*Trick or Treat*

```
20 CLS
30 PRINT "HI. WHAT IS YOUR NAME?"
40 PRINT "(PLEASE PRESS THE"
50 PRINT " ENTER KEY AFTER"
60 PRINT " EACH REPLY.)"
80 PRINT AT 21,0; "MY NAME IS";
90 INPUT N$
100 CLS
110 PRINT "TELL ME, ";N$;",";
120 PRINT "WHAT IS YOUR COSTUME?"
140 PRINT AT 21,0; "I AM";
150 INPUT C$
160 CLS
170 PRINT "I ALWAYS WANTED"
180 PRINT "TO BE ";C$;"; TOO."
190 PRINT "BUT I AM STILL HAPPY"
200 PRINT "BEING A COMPUTER."
210 GOSUB 1000
220 PRINT
230 PRINT "WHAT IS YOUR FRIEND"
240 PRINT "DRESSED UP AS?"
260 PRINT AT 21,0; "MY FRIEND IS";
270 INPUT F$
280 CLS
290 PRINT F$;" AND"
300 PRINT C$;"."
310 PRINT "WHAT A PAIR..."
320 GOSUB 1000
330 PRINT
340 PRINT "TYPE THE SECRET WORD"
350 PRINT "TO GET A TREAT."
360 PRINT "(HINT: OOB)"
370 INPUT W$
380 IF W$ = "BOO" THEN GOTO 420
390 CLS
400 PRINT "THAT IS NOT IT, ";N$;"."
410 GOTO 330
420 CLS
430 FOR T = 1 TO 35
440 PRINT "      HAPPY HALLOWEEN";
470 NEXT T
480 CLS
490 PRINT "GOODBYE --"
500 PRINT "SEE YOU NEXT YEAR..."
510 GOSUB 1000
520 GOTO 20
1000 FOR D = 1 TO 100
1010 NEXT D
1020 RETURN
```

Modifications for Other Computers/*Trick or Treat*

For the Commodore 64 and VIC-20 replace HOME in lines 10, 90, 150, 270, 380, 410, and 470 with PRINT CHR\$(147)
Also, change line 1000 to read
1000 FOR D = 1 TO 2200

For the TRS-80s and IBM PC replace HOME in lines 10, 90, 150, 270, 380, 410, and 470 with CLS

Also, change lines 40 and 420 to read
40 PRINT " ENTER KEY AFTER"
420 FOR T = 1 TO 30

NOAH WEBSTER, MEET YOUR MATCH.



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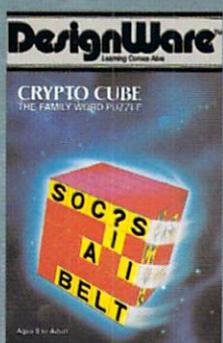
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BEGINNER PROGRAMS

PULSE RATE

BY JOEY LATIMER

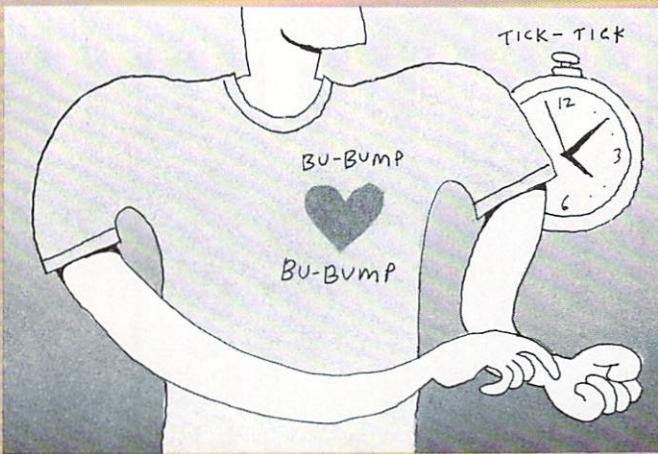


ILLUSTRATION BY JOSH GOSFIELD

After you've logged in your daily jog around the block (see "Logging Your Jogging," pages 80 to 82), you might want to test your *Pulse Rate* by typing in this program and running it. When your computer tells you to STAND BY . . . , place your fingertip (not your thumb) on the inner surface of your wrist, below the base of your thumb. (An artery runs under the skin there.) The computer will give you time to get ready and then say START! Count the number of beats until the computer asks you to stop. Then type in that number, and your computer will calculate how many times

your heart is beating per minute.

Note that the last number on line 120 controls how long the computer times you. This number varies from computer to computer because some brands run faster than others. In addition, the timing of your computer may be slightly different from ours. Before actually using the program, you should first test it against the second hand of a watch to see that it times you for exactly 30 seconds. If the program is running fast or slow, increase or decrease the number in line 120, starting first with a change of 100.

Apple/Pulse Rate

```

20 HOME
30 PRINT "TO TEST YOUR PULSE"
40 PRINT "RATE, PLEASE PRESS THE RETURN KEY."
50 INPUT R$
60 HOME
70 PRINT "STAND BY....."
80 FOR T = 1 TO 7600
90 NEXT T
100 HOME
110 PRINT "START!"
120 FOR T = 1 TO 22000
130 NEXT T
140 HOME
150 PRINT "STOP!"
160 PRINT
170 PRINT "TYPE IN THE NUMBER OF"
180 PRINT "BEATS YOU COUNTED;"
190 PRINT "THEN PRESS THE RETURN KEY."
200 INPUT B
210 PRINT
220 PRINT "YOUR PULSE RATE IS ";
230 PRINT B * 2" BEATS PER MINUTE."
240 PRINT "PRESS THE RETURN KEY."
250 PRINT "TO TRY AGAIN."
260 INPUT T$
270 GOTO 20
  
```

Atari/Pulse Rate

```

10 DIM R$(1), T$(1)
20 PRINT CHR$(125)
30 PRINT "TO TEST YOUR PULSE"
40 PRINT "RATE, PLEASE PRESS THE RETURN KEY."
50 INPUT R$
60 PRINT CHR$(125)
70 PRINT "STAND BY....."
80 FOR T=1 TO 4000
90 NEXT T
100 PRINT CHR$(125)
110 PRINT "START!"
120 FOR T=1 TO 10000
130 NEXT T
140 PRINT CHR$(125)
150 PRINT "STOP!"
160 PRINT
170 PRINT "TYPE IN THE NUMBER OF"
180 PRINT "BEATS YOU COUNTED;"
190 PRINT "THEN PRESS THE RETURN KEY."
200 INPUT B
210 PRINT
220 PRINT "YOUR PULSE RATE IS "
230 PRINT B*2; " BEATS PER MINUTE."
240 PRINT "PRESS THE RETURN KEY"
250 PRINT "TO TRY AGAIN."
260 INPUT T$
270 GOTO 20
  
```

Commodore 64 & VIC-20/Pulse Rate

```

20 PRINT CHR$(147)
30 PRINT "TO TEST YOUR PULSE"
40 PRINT "RATE PLEASE PRESS THE RETURN KEY."
50 INPUT R$
60 PRINT CHR$(147)
70 PRINT "STAND BY....."
80 FOR T=1 TO 7500
90 NEXT T
100 PRINT CHR$(147)
110 PRINT "START!"
120 FOR T=1 TO 20500
130 NEXT T
140 PRINT CHR$(147)
150 PRINT "STOP!"
160 PRINT
170 PRINT "TYPE IN THE NUMBER OF"
180 PRINT "BEATS YOU COUNTED;"
190 PRINT "THEN PRESS THE RETURN KEY."
200 INPUT B
210 PRINT
220 PRINT "YOUR PULSE RATE IS "
230 PRINT B*2"BEATS PER MINUTE."
240 PRINT "PRESS THE RETURN KEY"
250 PRINT "TO TRY AGAIN."
260 INPUT T$
270 GOTO 20
  
```

TI-99/4A/Pulse Rate

```

20 CALL CLEAR
30 PRINT "TO TEST YOUR PULSE"
40 PRINT "RATE, PLEASE PRESS THE ENTER KEY."
50 INPUT R$
60 CALL CLEAR
70 PRINT "STAND BY....."
80 FOR T=1 TO 4000
90 NEXT T
100 CALL CLEAR
110 PRINT "START!"
120 FOR T=1 TO 10000
130 NEXT T
140 CALL CLEAR
150 PRINT "STOP!"
160 PRINT
170 PRINT "TYPE IN THE NUMBER OF"
180 PRINT "BEATS YOU COUNTED;"
190 PRINT "THEN PRESS THE ENTER KEY."
  
```

```

200 INPUT B
210 PRINT
220 PRINT "YOUR PULSE RATE IS ";
230 PRINT B*2;"BEATS PER MINUTE."
240 PRINT "PRESS THE ENTER KEY"
250 PRINT "TO TRY AGAIN."
260 INPUT T$
270 GOTO 20

```

Timex Sinclair 1000/Pulse Rate

```

20 CLS
30 PRINT "TO TEST YOUR PULSE"
40 PRINT "RATE PLEASE PRESS THE ENTER KEY."
50 INPUT R$
60 CLS
70 PRINT "STAND BY....."
80 PAUSE 300
100 CLS
110 PRINT "START."
120 PAUSE 1800
150 PRINT "STOP."
160 PRINT
170 PRINT "TYPE IN THE NUMBER OF"
180 PRINT "BEATS YOU COUNTED;"
190 PRINT "THEN PRESS THE ENTER KEY."
200 INPUT B
210 PRINT
220 PRINT "YOUR PULSE RATE IS "
230 PRINT B*2;" BEATS PER MINUTE."
270 STOP

```

TRS-80s and IBM PC/Pulse Rate

```

20 CLS
30 PRINT "TO TEST YOUR PULSE"
40 PRINT "RATE PLEASE PRESS THE ENTER KEY."
50 INPUT R$
60 CLS
70 PRINT "STAND BY....."
80 FOR T=1 TO 4000
90 NEXT T
100 CLS
110 PRINT "START!"
120 FOR T=1 TO 14000
130 NEXT T
140 CLS
150 PRINT "STOP!"
160 PRINT
170 PRINT "TYPE IN THE NUMBER OF"
180 PRINT "BEATS YOU COUNTED;"
190 PRINT "THEN PRESS THE ENTER KEY."
200 INPUT B
210 PRINT
220 PRINT "YOUR PULSE RATE IS";
230 PRINT B*2 "BEATS PER MINUTE."
240 PRINT "PRESS THE ENTER KEY"
250 PRINT "TO TRY AGAIN."
260 INPUT T$
270 GOTO 20

```

Line 120 as given above produces a 30-second delay on our TRS-80 Color Computer. If you have another TRS-80 or an IBM PC, try the following change:

For this computer

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IBM PC without disk	24700
IBM PC with DOS 1.10	24000

Change "14000" in line 120 to

11200
10400
11700
11400
12000
21500
24700
24000



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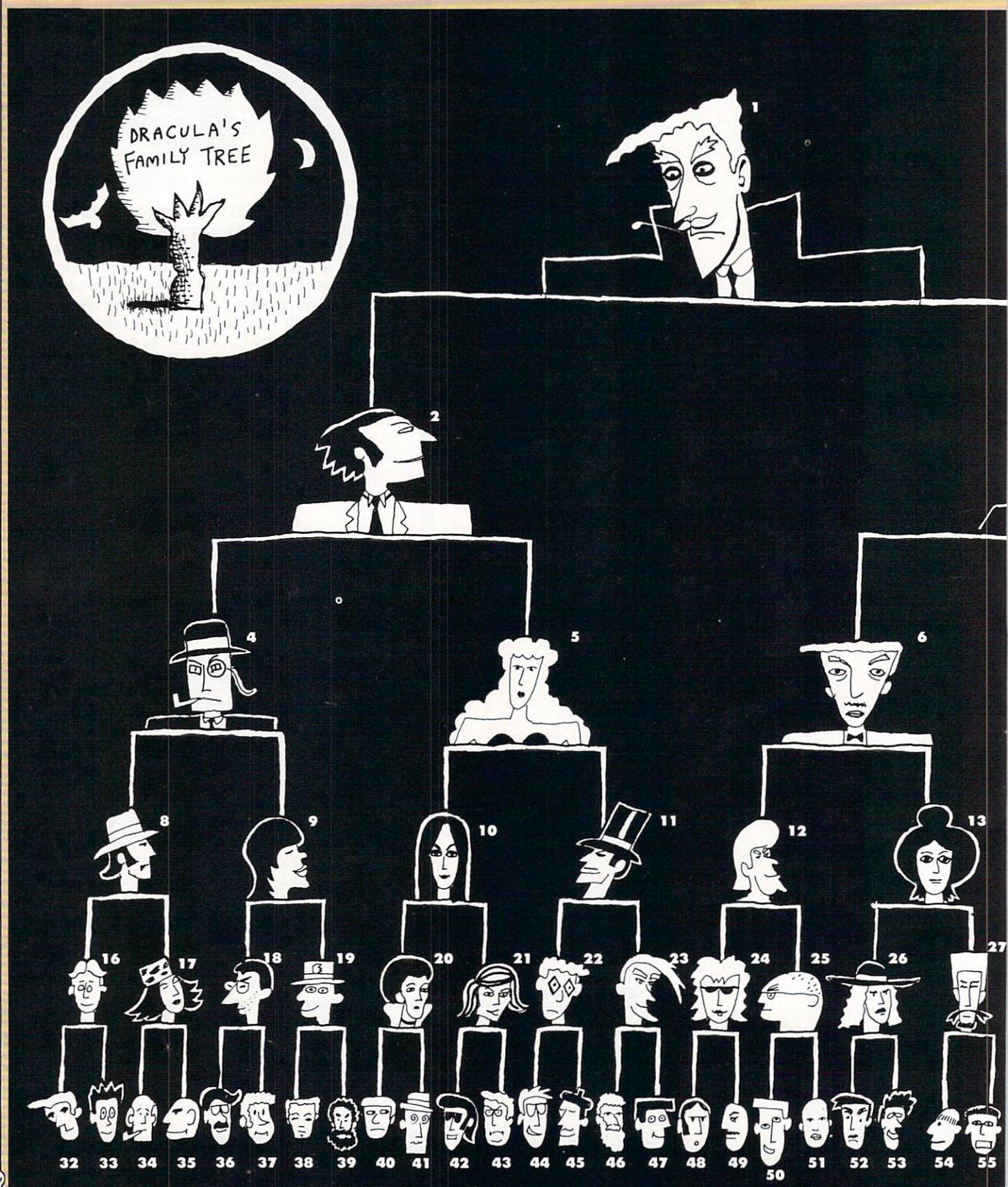
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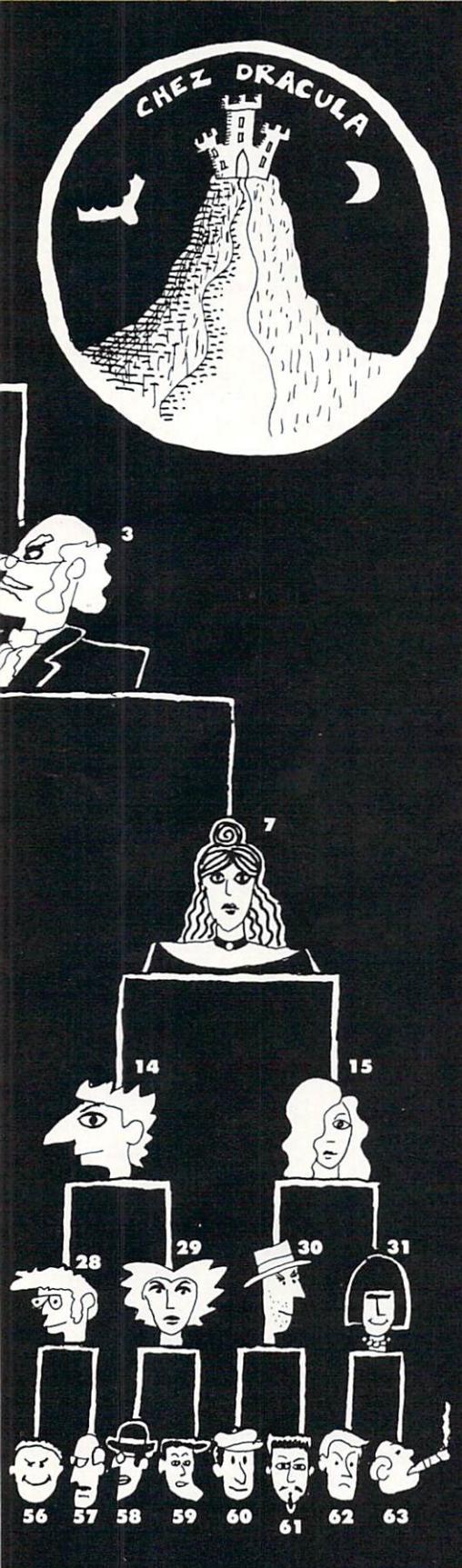
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DRACULA'S FAMILY TREE

BY STEPHEN McMANUS





As the bell tolls midnight, Count Dracula creeps stealthily down the castle corridor. The passageway is dark, save for the single candle he holds in his hand. Even the warmth of its flickering yellow flame can add no color to the Count's *very pale skin*. It is the pallor of one who never sees the light of day, but comes to *life* only at *night*. His dark clothing recedes into the background. The Count is still dressed in formal attire *for dinner*, although the time for that repast has passed many hours ago.

As Count Dracula reaches a door, he glances sharply behind him to make sure that his entry has gone unobserved. Inside lies the sleeping wife of one of his enemies. As he has done so often before, Dracula retaliates by choosing as his victim a woman who is important to his antagonist [indicating his possible *misogynous* (woman-hating) attitude].

Dracula leans over the sleeping woman, his repulsive *caninelike teeth* ready to draw his dinner of blood from her slender neck. Suddenly a noise can be heard out in the corridor. The instant the door opens Dracula vanishes, making his escape by *transformation*. All that can be seen through the open window is the strange sight of a *bat* flapping its wings in the moonlight.

Who was this horrible Count Dracula? Did he ever actually live? Dracula first came to public attention through a book writ-

ten by Bram Stoker in 1896. Stoker based his imaginary count on a real person: the bloody Prince Dracula who ruled part of Transylvania (in what is now Romania) some 500 years ago.

But where did Dracula come from? That is for you to figure out!

Shown at left is a fictionalized version of Dracula's family tree. Only "blood" relatives are pictured, but marriage introduced new characteristics into the family at each generation. Your job is to find out which branch of this family tree produced Dracula by tracing the transmission of various traits from parent to child. For example, as you'll soon discover, the grand patriarch Baron Russoff passed his *very pale skin* on to everyone, but it was intermarriage at a later generation that introduced the characteristic Dracula *caninelike teeth* into one branch of the family.

One of the men shown at the bottom of the tree is Dracula's father—but which? When you run the following program, it will ask you for your guess (type in the first name only), and on your screen will appear a description of that person. If he has all of Dracula's characteristics, you have discovered the chain of ancestors from which the legendary count descended.

You may be lucky and guess right on your first try. But, it's more likely to take several tries to figure out which branches of the tree carry which characteristics. Remember to think after each try! The computer is counting your guesses and will grade you on your investigative skill at the end. How few guesses will it take you to find the right answer?

STEPHEN McMANUS is a freelance recording engineer living in Los Angeles. He has worked with numerous musicians including Toto, Elton John, and Bette Midler. He recently sold his motorcycle to buy a VIC-20.

PUZZLE

Base Version (VIC-20)/Dracula's Family Tree

```

10 DIM B$(32),C$(23),C(5),P$(6),NU(15)
20 FOR I = 1 TO 32 : READ B$(I) : NEXT I
50 FOR I = 1 TO 23 : READ C$(I) : NEXT I
80 FOR I = 1 TO 6 : READ P$(I) : NEXT I
110 FOR I = 1 TO 15 : READ NU(I) : NEXT I
140 SC = 1
150 PRINT CHR$(147) : PRINT "GUESS #";SC
170 PRINT "WHAT WAS DRACULA'S" : PRINT "FATHER'S FIRST NAME" : INPUT N$
190 W = 0
200 FOR I = 1 TO 32
210 IF N$ = B$(I) THEN W = I
230 NEXT I
240 IF W = 0 THEN 150
250 SC = SC + 1
260 C(1) = 1 - (W > 16)
270 C(2)= 3 - (W > 8) - (W > 24)
280 OF = 6
290 FOR M = 1 TO 3
300 A = NU(M * 5 - 4)
310 B = NU(M * 5 - 3)
320 D = NU(M * 5 - 2)
330 V = NU(M * 5 - 1)
340 Q = NU(M * 5)
350 I = INT((W / V) + 0.8)
360 F = A * I ^ 3 + B * I * I + D * I
370 N = OF + (INT(F - INT(F / Q) * Q))
380 OF = OF + Q
390 C(M+2) = N
400 NEXT M
410 PRINT CHR$(147)
420 A$ = N$ + " LIKED TO DRESS " + C$(C(3)) +
". HE HAD "
490 A$ = A$ + C$(C(2)) + " AND VERY PALE SKIN
. HE "
520 A$ = A$ + C$(C(4)) + " AND WAS REPUTED TO
"
550 A$ = A$ + C$(C(5)) + ". AND HE " + C$(C(
1)) + "."
600 IF LEN(A$) < 21 THEN 690
610 FOR I = 1 TO 22
620 IF ASC(MID$(A$,I,1)) = 32 THEN J = I
640 NEXT I
650 PRINT LEFT$(A$, (J - 1))
660 K = LEN(A$) - J
670 A$ = RIGHT$(A$,K)
680 GOTO 600
690 PRINT A$ : PRINT : PRINT : PRINT
730 FOR M = 1 TO 3000 : NEXT M
750 IF C(1) + C(2) + C(3) + C(4) + C(5) = 37
THEN 830
760 PRINT "SORRY. ";N$;" WAS"
770 PRINT "NOT DRACULA'S FATHER."
780 PRINT : PRINT "(PRESS THE RETURN"
800 PRINT " KEY TO GO ON)": : INPUT I$
820 GOTO 150
830 PRINT "CONGRATULATIONS!"
840 PRINT "YOU HAVE FOUND" : PRINT "DRACULA'S
FATHER. IT"
850 I = INT(SC/5) + 1 : IF I > 6 THEN I = 6
890 IF SC = 2 THEN 940
900 PRINT "TOOK YOU ";SC-1;"GUESSES," : PRINT
"WHICH MAKES YOU A"
920 PRINT P$(I); " INVESTIGATOR."
930 END
940 PRINT "TOOK YOU ONE GUESS,"
950 PRINT "WHICH MAKES YOU VERY" : PRINT "LUC
KY."
970 PRINT " (UNLESS YOU CHEATED!)"
980 END
2000 DATA JERZY, BORGO, PETROT, HENDEL, BARTE
L, VROLOK, DARDALAND, URIC
2010 DATA JANUS, BURGEN, ISTENSZEK, SPURGI, O
RDOG, TAJ, ARPAD, BOSPHORUS
2020 DATA MITTEL, ARMINIUS, BOYAR, MALVOLIO,
FERRIER, PARR, VLAD, HOP

```

```

2030 DATA HAMLET, DRAKO, VULEO, ZSIGMOND, NOS
, GARLAND, VOIVODE, TURK
2040 DATA COULD CHANGE INTO A BAT, WAS NOT AN
ACROBAT
2050 DATA A NICE SMILE, CANINELIKE TEETH, DEN
TURES
2060 DATA FOR DINNER, LIKE A SLOB, IN RAGS, D
OWN
2070 DATA LOVED THE NIGHT LIFE, WORKED 9 TO 5
, ROSE WITH THE CHICKENS
2080 DATA WAS HEALTHY WEALTHY AND WISE, ATE H
EARTY BREAKFASTS, PAINTED SUNRISES
2090 DATA BE MISOGYNOUS, SUPPORT WOMEN'S SUFF
RAGE, BE HAPPILY MARRIED
2100 DATA HAVE CLOSE WOMEN FRIENDS, FAVOR HIS
NIECES, HAVE A HAPPY WIFE
2110 DATA SPOIL HIS DAUGHTERS, SUPPORT A GIRL
S' ORPHANAGE
2120 DATA MASTER, SUPERIOR, GOOD, FAIR, MEDIO
CRE, POOR
2130 DATA 1.1, 2.2, 3.5, 4, 4
2140 DATA 5.8, 9.8, 7.6, 2, 6
2150 DATA 2.5, 5.71, 8.9, 1, 8

```

Atari/Dracula's Family Tree

```

10 DIM A$(100),S$(1000),S(62),N$(50),C(5),NU(
15),PA$(255),I$(1)
20 E=1:FOR I=1 TO 61:READ A$
30 S(I)=E:L=LEN(A$):S$(E,(L+E))=A$
40 E=E+L:NEXT I:S(62)=E
110 FOR I=1 TO 15:READ J:NU(I)=J:NEXT I
140 SC=1
150 PRINT CHR$(125); "GUESS #";SC
170 PRINT "WHAT WAS DRACULA'S":PRINT "FATHER'
S FIRST NAME":INPUT N$
190 W=0
200 FOR I=1 TO 32
210 GOSUB 1000:IF N$=A$ THEN W=I
230 NEXT I
240 IF W=0 THEN 150
250 SC=SC+1
260 C(1)=33+(W>16)
270 C(2)=35+(W>8)+(W>24)
280 OF=6
290 FOR M=1 TO 3
300 A=NU(M*5-4)
310 B=NU(M*5-3)
320 D=NU(M*5-2)
330 V=NU(M*5-1)
340 Q=NU(M*5)
350 I=INT((W/V)+0.8)
360 F=A*I*I*I+B*I*I+D*I
370 N=OF+(INT(F-INT(F/Q)*Q))
380 OF=OF+Q
390 C(M+2)=N+32
400 NEXT M
410 PRINT CHR$(125)
420 PA$=""
430 I=C(3):GOSUB 1000
440 PA$=N$
450 PA$(LEN(PA$)+1)=" LIKED TO DRESS "
460 PA$(LEN(PA$)+1)=A$
470 PA$(LEN(PA$)+1)=" . HE HAD "
480 I=C(2):GOSUB 1000
490 PA$(LEN(PA$)+1)=A$
500 PA$(LEN(PA$)+1)=" AND VERY PALE SKIN. HE
"
510 I=C(4):GOSUB 1000
520 PA$(LEN(PA$)+1)=A$
530 PA$(LEN(PA$)+1)=" AND WAS REPUTED TO "
540 I=C(5):GOSUB 1000
550 PA$(LEN(PA$)+1)=A$
560 PA$(LEN(PA$)+1)=" . AND HE "
570 I=C(1):GOSUB 1000
580 PA$(LEN(PA$)+1)=A$
590 PA$(LEN(PA$)+1)=" . "

```

```

600 IF LEN(FA$) < 37 THEN 690
610 FOR I=1 TO 38
620 IF FA$(I,I) = " " THEN J=I
640 NEXT I
650 PRINT FA$(1,J-1)
660 K=LEN(FA$)-J
670 FA$=FA$(J+1,LEN(FA$))
680 GOTO 600
690 PRINT FA$:PRINT :PRINT :PRINT
730 FOR M=1 TO 1000:NEXT M
750 IF C(1)+C(2)+C(3)+C(4)+C(5)=197 THEN 830
760 PRINT "SORRY. ";NF;" WAS"
770 PRINT "NOT DRACULA'S FATHER."
780 PRINT :PRINT " (PRESS THE RETURN"
800 PRINT " KEY TO GO ON)":INPUT I$
820 GOTO 150
830 PRINT "CONGRATULATIONS!"
840 PRINT "YOU HAVE FOUND":PRINT "DRACULA'S FATHER. IT"
850 I=INT(SC/5)+56:IF I>61 THEN I=61
890 IF SC=2 THEN 940
900 PRINT "TOOK YOU ";SC-1;" GUESSES.":PRINT "WHICH MAKES YOU A"
910 GOSUB 1000
920 PRINT A$;" INVESTIGATOR."
930 END
940 PRINT "TOOK YOU ONE GUESS."
950 PRINT "WHICH MAKES YOU VERY":PRINT "LUCKY ."
970 PRINT " (UNLESS YOU CHEATED!)"
980 END
1000 S=S(I):F=S(I+1)
1010 A$=S$(S,(F-1))
1020 RETURN
2000 DATA JERZY,BORG,BORGOT,HENDEL,BARTEL,VR
OLOK,DARDALAND,URIC
2010 DATA JANUS,BURGEN,ISTENSZEK,SPURGI,ORDOG
,TAJ,ARPAD,BOSPHORUS
2020 DATA MITTEL,ARMINIUS,BOYAR,MALVOLIO,FERR
IER,PARR,VLAD,HOF
2030 DATA HAMLET,DRAKO,VULEO,ZSIGMOND,NOS,GAR
LAND,VOIVODE,TURK
2040 DATA COULD CHANGE INTO A BAT,WAS NOT AN
ACROBAT
2050 DATA A NICE SMILE,CANINELIKE TEETH,DENTU
RES
2060 DATA FOR DINNER,LIKE A SLOB,IN RAGS,DOWN
2070 DATA LOVED THE NIGHT LIFE,WORKED 9 TO 5,
ROSE WITH THE CHICKENS
2080 DATA WAS HEALTHY WEALTHY AND WISE,ATE HE
ARTY BREAKFASTS,PAINTED SUNRISES
2090 DATA BE MISOGYNOUS,SUPPORT WOMEN'S SUFFER
AGE,BE HAPPILY MARRIED
2100 DATA HAVE CLOSE WOMEN FRIENDS,FAVOR HIS
NIECES,HAVE A HAPPY WIFE
2110 DATA SFOIL HIS DAUGHTERS, SUPPORT A GIRL
S' ORPHANAGE
2120 DATA MASTER,SUPERIOR,GOOD,FAIR,MEDIocre.
POOR
2130 DATA 1.1, 2.2, 3.5, 4, 4
2140 DATA 5.8, 9.8, 7.6, 2, 6
2150 DATA 2.5, 5.71, 8.9, 1, 8

```

MODIFICATIONS FOR OTHER COMPUTERS

Apple/Dracula's Family Tree

Use the base version, except change lines 150, 260, 270, 410, 600, 610, and 730 to read

```

150 HOME: PRINT "GUESS #";SC
260 C(1) = 1 + (W > 16)
270 C(2) = 3 + (W > 8) + (W > 24)
410 HOME
600 IF LEN(A$) < 39 THEN 690
610 FOR I = 1 TO 38
730 FOR M = 1 TO 1000: NEXT M

```

Commodore 64/Dracula's Family Tree

Change lines 600 and 610 of the base version to read

```

600 IF LEN(A$) < 40 THEN 690
610 FOR I = 1 TO 39

```

IBM PC/Dracula's Family Tree

Change lines 150, 410, 600, 610, and 780 of the base version to read

```

150 CLS: PRINT "GUESS #";SC
410 CLS
600 IF LEN (A$) < 39 THEN 690
610 FOR I = 1 TO 38
780 PRINT: PRINT: PRINT " (PRESS THE ENTER"

```

TI-99/4A/Dracula's Family Tree

Most dialects of BASIC allow more than one statement on a single program line; see lines 20, 50, 80, 110, 150, 690, 730, 780, 800, 840, 900, and 950 of the base version. However, TI BASIC requires that each statement have its own line number. We have allowed extra line numbers for this purpose. So, for example, if you have TI BASIC you would expand line 20 of the base version into three lines:

```

20 FOR I = 1 TO 32
30 READ B$(I)
40 NEXT I

```

If you have TI Extended BASIC, you may place several statements on one program line, but they must be separated by a double colon ("::") instead of a single colon. So, for example, you would enter line 20 as

```
20 FOR I = 1 TO 32 :: READ B$(I) :: NEXT I
```

In addition, for either BASIC you must change lines 150, 170, 410, 420, 490, 520, 550, 600, 610, 650, 670, 730, 780, and 890 to read

```

150 CALL CLEAR :: PRINT "GUESS #";SC
170 PRINT "WHAT WAS DRACULA'S FATHER'S FIRST
NAME " :: INPUT NF
410 CALL CLEAR
420 A$ = NF & " LIKED TO DRESS " & " C$(C(3))
& ". HE HAD "
490 A$ = A$ & C$(C(2)) & " AND VERY PALE
SKIN. HE "
520 A$ = A$ & C$(C(4)) & " AND WAS REPUTED TO
"
550 A$ = A$ & C$(C(5)) & ". AND HE " &
C$(C(1)) & "."
600 IF LEN(A$) < 26 THEN 690
610 FOR I = 1 TO 27
650 PRINT SEG$(A$,1,(J-1))
670 A$ = SEG$(A$, (J+1), (K+2))
730 FOR M = 1 TO 500 :: NEXT M
780 PRINT :: PRINT :: PRINT " (PRESS THE
ENTER"
890 IF SC = 2 THEN 940

```

(Of course, for TI BASIC you must divide the statements in lines 150, 170, 730, and 780 into separate lines.)

TRS-80s/Dracula's Family Tree

Change lines 10, 150, 360, 410, 600, 610, and 780 of the base version to read

```

10 CLEAR 1000: DIM B$(32), C$(23), C(5),
P$(6), NU(15)
150 CLS: PRINT "GUESS #";SC
360 F=A*I*I*I+B*I*I+C*I
410 CLS
600 IF LEN(A$) < 31 THEN 690
610 FOR I = 1 TO 30
780 PRINT: PRINT: PRINT " (PRESS THE ENTER"

```

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LOGGING YOUR JOGGING

BY NOËL DERECKI

STORY BY JEFF DERECKI

There I was, contorted in one of my post-run stretching exercises on the floor of my one-room apartment in Brooklyn, New York. My 14-year-old son Noël, who visits me regularly (I'm a 44-year-old divorced father), was nearby, teaching himself how to program. As I slipped from one exercise position to another, my mind's eye, as always, was recreating my run in preparation for entering it into my brown vinyl running diary, which I've been keeping since 1979. Quantities such as temperature, humidity, wind, and miles and minutes run, as well as subjective comments about the scenery and aggressive dogs (and people), are entered in a shorthand that would require an archaeologist's expertise to decipher three months later:

"T-85°, H-75%, W 0-10, Sun., Pres. to GAP, CW to PC (15:00), CCW to GAP (14:30) (7:15/mi.) (phew!), GAP to Pres. (7:23/mi.)"

As I began to record the morning's run in my diary, I sensed a restlessness from across the room. At that moment in time, a superannuated marathoner and his son, the programmer, were to meet on a common ground with the question: "Do you have any ideas for a program, Dad?"

Oh, serendipity! Did I have an idea? Sitting on the floor, calculator on my knee, diary on the other, perspiration blotting earli-

er entries, trying to keep my glasses from sliding down my nose, while adding up my miles—did I have an idea?

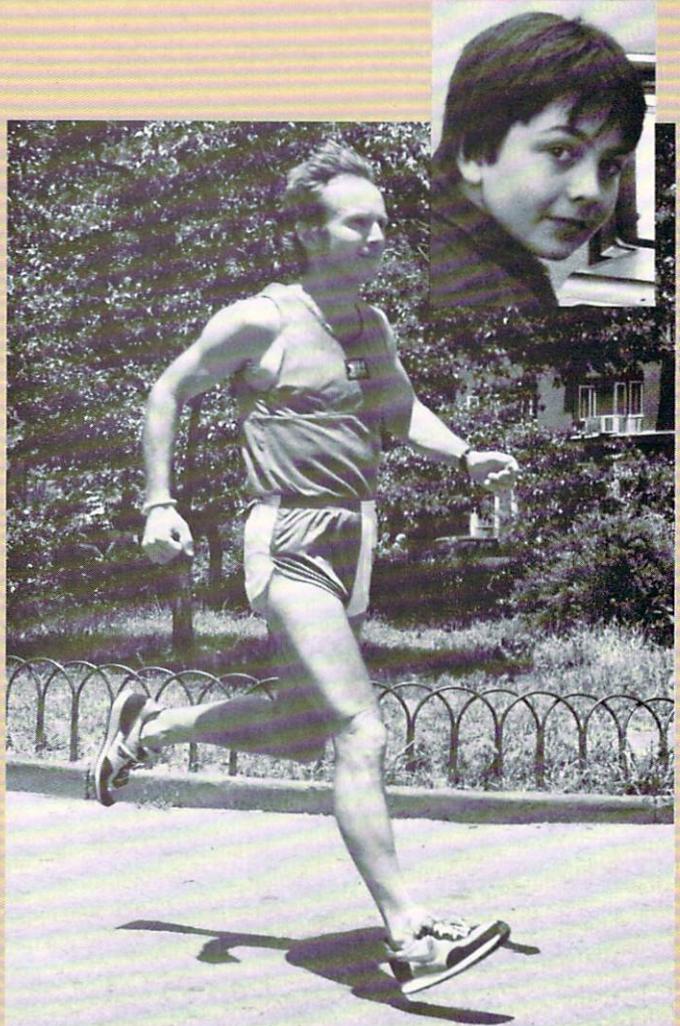
"How about a running diary?" Noël started to move like lightning on the keyboard. I prepared a fruit drink. Several visits later, the program was completed.

And what an improvement it is over my old system! Now the computer does nearly all my work for me. At the end of each day's entry it instantly averages my minutes per mile. Now I can call up old entries in readable form. But best of all, I can review all my running records between any past two dates I select. The computer will automatically calculate quantities such as total number of runs, total distance run, and total minutes run for that period, as well as provide me with overall averages of distance, time, and speed.

This is extremely useful for a runner trying to check his or her progress and create a realistic training program for an upcoming race.

I also see average temperature, wind speed, and humidity for the period, which sometimes helps to explain an unexpected poor performance. For instance, I might discover that my fatigue resulted from trying to run my usual weekly quota of miles through four or five days of extreme weather conditions.

But most of all, this program has now made keeping a running diary fun. My son developed the program so that it asks me questions about my morning run. And as an inspirational flourish, it opens by playing Scott Joplin's lively *The Entertainer*.



PHOTOGRAPH BY EILEEN RAFFERTY

PHOTOGRAPH BY VINCENT CECI

Commodore 64/Personal Running Diary

```

10 DIM D(8),D$(12),A$(22),B(22),HF(8),LF(8),H
M(8),LM(8),HO(8),LO(8)
20 GOSUB 1000
30 PRINT:PRINT "DO YOU WISH TO"
40 PRINT "      1-ADD A NEW ENTRY"
50 PRINT "      2-RECALL A PARTICULAR ENTRY"
60 PRINT "      3-ANALYZE A RANGE OF ENTRIES":
PRINT "      4-QUIT"
70 INPUT "      CHOOSE 1-4":I:IF I=4 THEN END
80 ON I GOSUB 2000,3000,4000
90 PRINT CHR$(147);* PERSONAL RUNNING D
IARY *:GOTO 30
1000 S=54272
1010 FOR I=0 TO 24:POKE S+I,0:NEXT I
1020 POKE S+5,9:POKE S+12,9
1030 POKE S+20,240:POKE S+24,15
1040 FOR I=1 TO 18
1050 READ A$(I),J:B(I)=J*I15:NEXT I
1060 FOR I=1 TO 8
1070 READ HF(I),LF(I),HM(I),LM(I),HO(I),LO(I)
1080 NEXT I
1100 DATA H,4,I,4,E,3,C,6,E,3,C,6,E,3,C,18,C
1110 DATA 3,D,3,F,3,G,3,C,3,D,3,G,6,B,3,D,6,C
1120 DATA 18,32,94,16,47,64,188,34,75,17,37
1130 DATA 68,149,38,126,19,63,76,252,21,154
1140 DATA 10,205,43,52,40,200,20,100
1150 DATA 81,161,43,52,21,154,86,105,19,63
1160 DATA 9,159,38,126,20,100,10,60,40,200
1200 PRINT CHR$(147):FOR I=1 TO 18
1210 P=ASC(A$(I))-65
1220 POKE S+1,HF(P):POKE S,LF(P)

```

NOËL DERECKI, the author of this program, is a sophomore at Stuyvesant High School in New York City. His father, Jeff, is a magazine designer and ardent runner, who occasionally jogs across the Brooklyn Bridge to vary his route, waving to the Statue of Liberty midway "because it always seems like she's waving to me!"

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READER-WRITTEN PROGRAMS

```

1230 POKE S+8,HO(P):POKE S+7,LO(P)
1240 POKE S+15,HM(P):POKE S+14,LM(P)
1250 POKE S+4,17:POKE S+11,17:POKE S+18,17
1260 FOR J=1 TO B(I):NEXT J
1270 POKE S+4,16:POKE S+11,16:POKE S+18,16
1280 PRINT " * PERSONAL RUNNING DIARY *"
1290 FOR K=1 TO B(I):NEXT K:NEXT I
1300 PRINT CHR$(147); " * PERSONAL RUNNING
DIARY *":RETURN
2000 GOSUB 2100:GOSUB 2200:GOSUB 2400
2010 GOSUB 2500:GOSUB 5100
2020 PRINT " CHOOSE 1-TO REVISE DATE"
2030 PRINT " 2-TO REVISE WEATHER DATA"
2040 PRINT " 3-TO REVISE RUNNING DATA"
2050 PRINT " 4-TO REVISE ROUTE DATA"
2060 PRINT " 5-TO SAVE THIS ENTRY TO TA
PE"
2070 INPUT " OR 6-TO RETURN TO MAIN MENU";
I:IF I=6 THEN RETURN
2080 ON I GOSUB 2100,2200,2400,2500,2600
2090 GOSUB 5100:GOTO 2020
2100 PRINT CHR$(147); " ----< DATE >--"
--":PRINT
2110 PRINT:PRINT "PLEASE INPUT TODAY'S DATE:"
2120 GOSUB 5000:D(1)=D:D$(3)=D$:RETURN
2200 PRINT CHR$(147); " ----< WEATHER >--"
--":PRINT:PRINT "TEMPERATURE";
2210 INPUT D(2):INPUT "RELATIVE HUMIDITY";D(3)
2220 PRINT:INPUT "WIND - SPEED (MPH)";D(4)
2230 PRINT " - DIRECTION:"
2240 PRINT " FROM 1-FRONT"
2250 PRINT " 2-SIDE"
2260 INPUT " OR 3-BACK";D(5)
2270 PRINT:PRINT "SKY / CLOUD COVER:"
2280 PRINT:PRINT " SUNNY CLOUDY
RAINY"
2290 PRINT " ^----+----+----+----+----+----+----+----+"
2300 PRINT " 1 2 3 4 5 6 7 8 9
10"
2310 PRINT:INPUT " INPUT NUMBER (1-10)";D(6):R
ETURN
2400 PRINT CHR$(147); " ----< RUNNING >--"
--":PRINT
2410 PRINT:INPUT "HOW MANY MILES DID YOU RUN";
D(7)
2420 PRINT:INPUT "FOR HOW MANY MINUTES DID YOU
RUN";D(8):RETURN
2430 PRINT:PRINT "OTHER COMMENTS ":"INPUT D$(2)
":RETURN
2500 PRINT CHR$(147); " ----< ROUTE >--"
--":PRINT
2510 PRINT:PRINT "(REMEMBER, NO COMMAS OR COLO
NS)":PRINT:PRINT
2520 PRINT "TERRAIN - SURFACE, GRADIENT, ETC."
:INPUT D$(1)
2530 PRINT:PRINT "OTHER COMMENTS:":INPUT D$(2)
:RETURN
2600 OPEN 1,1,1,"PRD-"+D$
2610 FOR I=1 TO 8:PRINT#1, D(I):NEXT I
2620 FOR I=1 TO 3:PRINT#1, D$(I):NEXT I
2630 CLOSE 1:RETURN
3000 PRINT CHR$(147); "INPUT DATE OF ENTRY YOU
WANT RECALLED":GOSUB 5000
3010 GOSUB 5300:IF D<>D(1) GOTO 3010
3020 GOSUB 5100:PRINT
3030 INPUT "PRESS RETURN FOR MAIN MENU ";I$
3040 RETURN
4000 PRINT CHR$(147); "INPUT FIRST DATE IN PERI
OD"
4010 GOSUB 5000:F=D:F=D$:PRINT
4020 PRINT "INPUT LAST DATE IN PERIOD"
4030 GOSUB 5000:L=D:L=D$:PRINT:PRINT
4040 PRINT "DO YOU WANT TO SEE EACH RECORD AS
IT IS READ IN"
4050 INPUT "(YES/NO) ";I$:J=ASC(I$)
4060 TL=0:TD=0:TT=0:TW=0:TH=0:NR=0:D=F
4070 GOSUB 5300:IF D>D(1) GOTO 4070

```

```

4080 IF D(1)>L GOTO 4120
4090 D=D(1)+1:NR=NR+1:TL=TL+D(8):TD=TD+D(7):TT
=TT+D(2):TW=TW+D(4):TH=TH+D(3)
4100 IF J=89 THEN GOSUB 5100:PRINT "RECORD #";
NR:INPUT "PRESS RETURN...";I$#
4110 IF D(1)<L GOTO 4070
4120 IF J<>89 THEN GOSUB 1200
4130 PRINT CHR$(147); " FROM ";F$;" TO ";L$:PR
INT
4140 IF NR=0 THEN PRINT:PRINT:PRINT " (NO RECO
RDS FOR THAT PERIOD)":GOTO 4240
4150 PRINT "THERE WERE";NR;"RECORDS --":PRINT
4160 PRINT "TOTAL MILES RUN:";TD;"MILES"
4170 PRINT " TOTAL TIME RUN:";TL;"MINUTES"
4180 PRINT:PRINT "AVERAGE DISTANCE:";INT((TD/N
R)*100)/100;"MILES"
4190 PRINT " AVERAGE TIME:";INT((TL/NR)*100
)/100;"MINUTES"
4200 PRINT " AVERAGE SPEED:";INT((TL/TD)*100
)/100;"MINUTES/MILE"
4210 PRINT:PRINT "AVERAGE TEMPERATURE.:";INT((T
T/NR)*100)/100;"DEGREES"
4220 PRINT "AVERAGE HUMIDITY....:";INT((TH/NR)
*100)/100;"%"
4230 PRINT "AVERAGE WIND SPEED.:";INT((TW/NR)
*100)/100;"MPH"
4240 PRINT:PRINT:INPUT "PRESS RETURN FOR MAIN
MENU";I$#:RETURN
5000 INPUT "MONTH (E.G., '11')...";M
5010 INPUT "DAY OF MONTH.....";D
5020 INPUT "YEAR (E.G., '83')...";Y
5030 D$=STR$(M)+"/"+STR$(D)+"//"+STR$(Y)
5040 D=D+(50*M)+(750*Y):RETURN
5100 PRINT CHR$(147); "[=====]=
=====]""
5110 PRINT "[ ";D$(3);TAB(23);D(2);"DEGREES";
TAB(37);"]"
5120 PRINT "[";TAB(37);"]"
5130 PRINT "[ WIND";D(4);"MPH, FROM THE ";
5140 IF D(5)=1 THEN PRINT "FRONT";
5150 IF D(5)=2 THEN PRINT "SIDE";
5160 IF D(5)=3 THEN PRINT "BACK";
5170 PRINT TAB(37);"]"
5180 PRINT "[ RELATIVE HUMIDITY:";D(3);"%";TA
B(37);"]"
5190 PRINT "[ CLOUD COVER (SCALE OF 1-10):";D
(6);TAB(37);"]"
5200 PRINT "[";TAB(37);"]"
5210 PRINT "[ YOU RAN:";D(7);"MILES IN";D(8);"
MINUTES";TAB(37);"]"
5220 PRINT "[ (AN AVERAGE OF";INT((D(8)/D(7)
)*100)/100;"MIN/MILE)";
5230 PRINT TAB(37);"]":PRINT "[";TAB(37);"]"
5240 PRINT "[ TERRAIN:";TAB(37);"]":PRINT "[
";D$(1);TAB(37);"]"
5250 PRINT "[";TAB(37);"]"
5260 PRINT "[ COMMENTS:";TAB(37);"]":PRINT "[
";D$(2);TAB(37);"]"
5270 PRINT "[=====]=
=====]"":PRINT:RETURN
5300 OPEN 1,1,0
5310 FOR I=1 TO 8:INPUT#1, D(I):NEXT I
5320 FOR I=1 TO 3:INPUT#1, D$(I):NEXT I
5330 CLOSE 1:RETURN

```

FAMILY COMPUTING wants to publish your best original computer programs. We are especially interested in those that have useful applications in the home and that do not exceed 100 lines. Send us a diskette or tape containing two copies of your program, plus a listing (preferably a printout). Include your name, address, phone number, age, computer model, the program title with a brief description of it, and the memory and level of BASIC required to The Programmer, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. We will pay \$50 for those we publish. If you want your diskette or tape returned, enclose a stamped, self-addressed mailer. FAMILY COMPUTING cannot assume responsibility for the loss or damage of any unsolicited materials.

A photograph showing a person from the waist down, standing in a body of water. The person is wearing a light-colored, short-sleeved shirt and blue jeans. They are holding a long, thin wooden pole or oar vertically, extending it towards the water. The water is relatively calm, with small ripples. In the background, there are dense green trees and some dark, rocky terrain. The overall scene suggests a rural or natural setting, possibly a lake or river.

TRS-80 Models I & II

10 CLS : PRINT #2
15 PRINT "Player game"
20 PRINT "The"
25 PRINT " Snake.
30 PRINT " make on the Left"
35 PRINT " the Second"
40 PRINT " the Right with
45 PRINT " the numberic"
50 PRINT " 4 is Left,"
55 PRINT " e with either"
60 PRINT " e get 7 points"
65 PRINT " to get 7 points"
70 PRINT " First"
80 INPUT "CLS",
90 INPUT "CLS",
100 CLS.

When you run Snakes,
directions will appear on
the screen. The object is to
move seven points before
the snake eats you. The snake
will move in the direction
you chose. If it hits itself
or the wall, it will die. You
will lose if the snake reaches
the end of the screen. You
will win if you eat all the
apples. Good luck!

SCOTT WELCH IS A 14-year-old ninth grader at Rippowam-Cisqua School in Beekscorl, New York, and the owner of a TRS-80 Model III. A programme since the fifth grade, his efforts have won him several prizes and a pile of "over 70 incomplete programs".

ly scribbled on the bus. Finally, I proudly typed run. waiting to see my new masterpiece come to life. It came to life all right — no bugs. The only problem was that it was 200 times slower than I had hoped. Who wants to play a nifty new arcade game when it takes more than two seconds to make a move? It was another move? I saved the program on a disk full of other incomplete .com-plex graphic games.

The reason I enjoy computer putting is probably similar to why some people climb mountains: "because it's there." I enjoy the challenge—especially overcomes the challenge.

That's it. That's the challenge. That's the challenge—especially overcome.

Our school bus bounced along the bumpy roads. I sat scribbling on a sheet of paper in the back, working out a new super subrou-tine for my latest program. When the bus reached my stop, I hopped out and ran up our dirt driveway and into our house, slam-ming the front door behind me. I ran down the hall into my bedroom and dumped my books all over the floor.

There it was—my com-puter! It sat faithfully on my desk, waiting for my arrival home from school. I slipped the little red light spinning in the drive. Then I unrumpled the paper still clenched in my fist. Ikeyed in the new lines that had been sloppi-

BY SCOTT WELSCHE

SNAKE WARS!

READER-WRITTEN PROGRAMS

110 FOR X=0 TO 127 : SET(X,47) : SET(X,3) : SET(X,47) : N
 120 FOR Y=4 TO 46 : SET(0,Y) : SET(1,Y) : SET(126,Y)
 130 PRINT Q1,N1\$: =":N1\$: PRINT Q59-LEN(N2\$)
 140 X=32 : X1=96 : Y=25 : Y1=25 : D=0 : D1=0
 150 SET(X,Y) : SET(X+1,Y) : SET(X+1,Y1) : SET(X+1,Y1) :
 155 PRINT Q59-LEN(N2\$) : N2\$="":N2+1:
 156 N2=N2+1 : IF N2<7 THEN 700
 157 FOR T=1 TO 10 :CLS:PRINT CHR\$(23):PRINT Q4
 158 FOR T2=1 TO 50:NEXT T2:CLS:FOR T2=1 TO 50
 159 FOR T=1 TO 10 :CLS:PRINT CHR\$(23):PRINT Q4
 160 PRINT Q22,"WINS !!!!"
 161 FOR T=1 TO 50 : RESET(X+1,Y1)
 162 FOR T2=1 TO 50 : NEXT T2
 163 SET(X1,Y1) : SET(X1+1,Y1)
 164 IF P=16 THEN D1=2
 165 IF P=32 THEN D1=3
 166 IF P=64 THEN D1=4
 167 IF P=112 THEN D1=5
 168 IF P=144 THEN D1=6
 169 IF P=176 THEN D1=7
 170 IF P=208 THEN D1=8
 171 IF P=240 THEN D1=9
 172 IF P=256 THEN D1=10
 173 IF P=288 THEN D1=11
 174 IF P=320 THEN D1=12
 175 IF P=352 THEN D1=13
 176 IF P=384 THEN D1=14
 177 IF P=416 THEN D1=15
 178 IF P=448 THEN D1=16
 179 IF P=480 THEN D1=17
 180 IF P=512 THEN D1=18
 181 IF P=544 THEN D1=19
 182 IF P=576 THEN D1=20
 183 IF P=608 THEN D1=21
 184 IF P=640 THEN D1=22
 185 IF P=672 THEN D1=23
 186 IF P=704 THEN D1=24
 187 IF P=736 THEN D1=25
 188 IF P=768 THEN D1=26
 189 IF P=800 THEN D1=27
 190 IF P=832 THEN D1=28
 191 IF P=864 THEN D1=29
 192 IF P=900 THEN D1=30
 193 IF P=936 THEN D1=31
 194 IF P=972 THEN D1=32
 195 IF P=1008 THEN D1=33
 196 IF P=1044 THEN D1=34
 197 IF P=1080 THEN D1=35
 198 IF P=1116 THEN D1=36
 199 IF P=1152 THEN D1=37
 200 IF P=1188 THEN D1=38
 201 IF P=1224 THEN D1=39
 202 IF P=1260 THEN D1=40
 203 IF P=1296 THEN D1=41
 204 IF P=1332 THEN D1=42
 205 IF P=1368 THEN D1=43
 206 IF P=1404 THEN D1=44
 207 IF P=1440 THEN D1=45
 208 IF P=1476 THEN D1=46
 209 IF P=1512 THEN D1=47
 210 IF P=1548 THEN D1=48
 211 IF P=1584 THEN D1=49
 212 IF P=1620 THEN D1=50
 213 IF P=1656 THEN D1=51
 214 IF P=1692 THEN D1=52
 215 IF P=1728 THEN D1=53
 216 IF P=1764 THEN D1=54
 217 IF P=1800 THEN D1=55
 218 IF P=1836 THEN D1=56
 219 IF P=1872 THEN D1=57
 220 IF P=1908 THEN D1=58
 221 IF P=1944 THEN D1=59
 222 IF P=1980 THEN D1=60
 223 IF P=2016 THEN D1=61
 224 IF P=2052 THEN D1=62
 225 IF P=2088 THEN D1=63
 226 IF P=2124 THEN D1=64
 227 IF P=2160 THEN D1=65
 228 IF P=2196 THEN D1=66
 229 IF P=2232 THEN D1=67
 230 IF P=2268 THEN D1=68
 231 IF P=2304 THEN D1=69
 232 IF P=2340 THEN D1=70
 233 IF P=2376 THEN D1=71
 234 IF P=2412 THEN D1=72
 235 IF P=2448 THEN D1=73
 236 IF P=2484 THEN D1=74
 237 IF P=2520 THEN D1=75
 238 IF P=2556 THEN D1=76
 239 IF P=2592 THEN D1=77
 240 IF P=2628 THEN D1=78
 241 IF P=2664 THEN D1=79
 242 IF P=2700 THEN D1=80
 243 IF P=2736 THEN D1=81
 244 IF P=2772 THEN D1=82
 245 IF P=2808 THEN D1=83
 246 IF P=2844 THEN D1=84
 247 IF P=2880 THEN D1=85
 248 IF P=2916 THEN D1=86
 249 IF P=2952 THEN D1=87
 250 IF P=2988 THEN D1=88
 251 IF P=3024 THEN D1=89
 252 IF P=3060 THEN D1=90
 253 SET(X1,Y1) : SET(X+1,Y1) : SET(X+1,Y1) :
 2540 FOR T2=1 TO 50 : NEXT T2
 2550 NEXT T
 2560 N2=N2+1 : IF N2<7 THEN 700
 2570 FOR T=1 TO 10 :CLS:PRINT CHR\$(23):PRINT Q4
 2580 FOR T2=1 TO 50:NEXT T2:CLS :FOR T2=1 TO 50
 2590 NEXT T2 :CLS :FOR T2=1 TO 50:NEXT T2:
 2600 PRINT Q22,"WINS !!!!"
 2610 RESET(X1,Y1) : RESET(X+1,Y1)
 2620 FOR T2=1 TO 50 : NEXT T2
 2630 SET(X1,Y1) : SET(X1+1,Y1)
 2640 FOR T2=1 TO 50 : NEXT T2
 2650 NEXT T
 2660 N1=N1+1 : IF N1<7 THEN 700
 2670 FOR T=1 TO 10 :CLS:PRINT CHR\$(23):PRINT Q4
 2680 FOR T2=1 TO 50:NEXT T2:CLS :FOR T2=1 TO 50
 2690 PRINT Q22,"WINS !!!!"
 2700 IF P=112 THEN D1=1
 2710 IF P=144 THEN D1=2
 2720 IF P=176 THEN D1=3
 2730 IF P=208 THEN D1=4
 2740 IF P=240 THEN D1=5
 2750 IF P=272 THEN D1=6
 2760 IF P=304 THEN D1=7
 2770 IF P=336 THEN D1=8
 2780 IF P=368 THEN D1=9
 2790 SET(X1,Y1) : SET(X+1,Y1) : SET(X+1,Y1) :
 2800 IF P=400 THEN D1=10
 2810 IF P=432 THEN D1=11
 2820 IF P=464 THEN D1=12
 2830 IF P=496 THEN D1=13
 2840 IF P=528 THEN D1=14
 2850 IF P=560 THEN D1=15
 2860 IF P=592 THEN D1=16
 2870 IF P=624 THEN D1=17
 2880 IF P=656 THEN D1=18
 2890 IF P=688 THEN D1=19
 2900 IF P=720 THEN D1=20
 2910 IF P=752 THEN D1=21
 2920 IF P=784 THEN D1=22
 2930 IF P=816 THEN D1=23
 2940 IF P=848 THEN D1=24
 2950 IF P=880 THEN D1=25
 2960 IF P=912 THEN D1=26
 2970 IF P=944 THEN D1=27
 2980 IF P=976 THEN D1=28
 2990 IF P=1008 THEN D1=29
 3000 IF P=1040 THEN D1=30
 3010 IF P=1072 THEN D1=31
 3020 IF P=1104 THEN D1=32
 3030 IF P=1136 THEN D1=33
 3040 IF P=1168 THEN D1=34
 3050 IF P=1200 THEN D1=35
 3060 IF P=1232 THEN D1=36
 3070 IF P=1264 THEN D1=37
 3080 IF P=1296 THEN D1=38
 3090 IF P=1328 THEN D1=39
 3100 IF P=1360 THEN D1=40
 3110 IF P=1392 THEN D1=41
 3120 IF P=1424 THEN D1=42
 3130 IF P=1456 THEN D1=43
 3140 IF P=1488 THEN D1=44
 3150 SET(X1,Y1) : SET(X+1,Y1) : SET(X+1,Y1) :
 3160 N2=N2+1 : IF N2<7 THEN 700
 3170 FOR T=1 TO 10 :CLS:PRINT CHR\$(23):PRINT Q4
 3180 FOR T2=1 TO 50:NEXT T2:CLS :FOR T2=1 TO 50
 3190 NEXT T2 :CLS :FOR T2=1 TO 50:NEXT T2:
 3200 PRINT Q22,"WITS !!!!"
 3210 IF P=1440 THEN D1=1
 3220 IF P=1760 THEN D1=2
 3230 IF P=2080 THEN D1=3
 3240 IF P=2400 THEN D1=4
 3250 IF P=2720 THEN D1=5
 3260 IF P=3040 THEN D1=6
 3270 IF P=3360 THEN D1=7
 3280 IF P=3680 THEN D1=8
 3290 SET(X1,Y1) : SET(X+1,Y1) : SET(X+1,Y1) :
 3300 IF P=4000 THEN D1=9
 3310 IF P=4320 THEN D1=10
 3320 IF P=4640 THEN D1=11
 3330 IF P=4960 THEN D1=12
 3340 IF P=5280 THEN D1=13
 3350 IF P=5600 THEN D1=14
 3360 IF P=5920 THEN D1=15
 3370 IF P=6240 THEN D1=16
 3380 IF P=6560 THEN D1=17
 3390 SET(X1,Y1) : SET(X+1,Y1) : SET(X+1,Y1) :
 3400 IF P=6880 THEN D1=18
 3410 IF P=7200 THEN D1=19
 3420 IF P=7520 THEN D1=20
 3430 IF P=7840 THEN D1=21
 3440 IF P=8160 THEN D1=22
 3450 IF P=8480 THEN D1=23
 3460 IF P=8800 THEN D1=24
 3470 IF P=9120 THEN D1=25
 3480 IF P=9440 THEN D1=26
 3490 IF P=9760 THEN D1=27
 3500 IF P=10080 THEN D1=28
 3510 IF P=10400 THEN D1=29
 3520 IF P=10720 THEN D1=30
 3530 SET(X1,Y1) : SET(X+1,Y1) : SET(X+1,Y1) :
 3540 FOR T2=1 TO 50 : NEXT T2
 3550 NEXT T
 3560 N2=N2+1 : IF N2<7 THEN 700
 3570 FOR T=1 TO 10 :CLS:PRINT CHR\$(23):PRINT Q4
 3580 FOR T2=1 TO 50:NEXT T2:CLS :FOR T2=1 TO 50
 3590 NEXT T2 :CLS :FOR T2=1 TO 50:NEXT T2:
 3600 PRINT Q22,"WITS !!!!"
 3610 IF P=1440 THEN D1=1
 3620 IF P=1760 THEN D1=2
 3630 IF P=2080 THEN D1=3
 3640 IF P=2400 THEN D1=4
 3650 IF P=2720 THEN D1=5
 3660 IF P=3040 THEN D1=6
 3670 IF P=3360 THEN D1=7
 3680 IF P=3680 THEN D1=8
 3690 IF P=4000 THEN D1=9
 3700 IF P=4320 THEN D1=10
 3710 IF P=4640 THEN D1=11
 3720 IF P=4960 THEN D1=12
 3730 IF P=5280 THEN D1=13
 3740 IF P=5600 THEN D1=14
 3750 IF P=5920 THEN D1=15
 3760 IF P=6240 THEN D1=16
 3770 IF P=6560 THEN D1=17
 3780 IF P=6880 THEN D1=18
 3790 IF P=7200 THEN D1=19
 3800 IF P=7520 THEN D1=20
 3810 IF P=7840 THEN D1=21
 3820 IF P=8160 THEN D1=22
 3830 IF P=8480 THEN D1=23
 3840 IF P=8800 THEN D1=24
 3850 IF P=9120 THEN D1=25
 3860 IF P=9440 THEN D1=26
 3870 IF P=9760 THEN D1=27
 3880 IF P=10080 THEN D1=28
 3890 IF P=10400 THEN D1=29
 3900 IF P=10720 THEN D1=30
 3910 IF P=11040 THEN D1=31
 3920 IF P=11360 THEN D1=32
 3930 IF P=11680 THEN D1=33
 3940 IF P=12000 THEN D1=34
 3950 IF P=12320 THEN D1=35
 3960 IF P=12640 THEN D1=36
 3970 IF P=12960 THEN D1=37
 3980 IF P=13280 THEN D1=38
 3990 IF P=13600 THEN D1=39
 4000 IF P=13920 THEN D1=40
 4010 IF P=14240 THEN D1=41
 4020 IF P=14560 THEN D1=42
 4030 IF P=14880 THEN D1=43
 4040 IF P=15200 THEN D1=44
 4050 IF P=15520 THEN D1=45
 4060 IF P=15840 THEN D1=46
 4070 IF P=16160 THEN D1=47
 4080 IF P=16480 THEN D1=48
 4090 IF P=16800 THEN D1=49
 4100 IF P=17120 THEN D1=50
 4110 IF P=17440 THEN D1=51
 4120 IF P=17760 THEN D1=52
 4130 IF P=18080 THEN D1=53
 4140 IF P=18400 THEN D1=54
 4150 IF P=18720 THEN D1=55
 4160 IF P=19040 THEN D1=56
 4170 IF P=19360 THEN D1=57
 4180 IF P=19680 THEN D1=58
 4190 IF P=20000 THEN D1=59
 4200 IF P=20320 THEN D1=60
 4210 IF P=20640 THEN D1=61
 4220 IF P=20960 THEN D1=62
 4230 IF P=21280 THEN D1=63
 4240 IF P=21600 THEN D1=64
 4250 IF P=21920 THEN D1=65
 4260 IF P=22240 THEN D1=66
 4270 IF P=22560 THEN D1=67
 4280 IF P=22880 THEN D1=68
 4290 IF P=23200 THEN D1=69
 4300 IF P=23520 THEN D1=70
 4310 IF P=23840 THEN D1=71
 4320 IF P=24160 THEN D1=72
 4330 IF P=24480 THEN D1=73
 4340 IF P=24800 THEN D1=74
 4350 IF P=25120 THEN D1=75
 4360 IF P=25440 THEN D1=76
 4370 IF P=25760 THEN D1=77
 4380 IF P=26080 THEN D1=78
 4390 IF P=26400 THEN D1=79
 4400 IF P=26720 THEN D1=80
 4410 IF P=27040 THEN D1=81
 4420 IF P=27360 THEN D1=82
 4430 IF P=27680 THEN D1=83
 4440 IF P=28000 THEN D1=84
 4450 IF P=28320 THEN D1=85
 4460 IF P=28640 THEN D1=86
 4470 IF P=28960 THEN D1=87
 4480 IF P=29280 THEN D1=88
 4490 IF P=29600 THEN D1=89
 4500 IF P=29920 THEN D1=90
 4510 IF P=30240 THEN D1=91
 4520 IF P=30560 THEN D1=92
 4530 IF P=30880 THEN D1=93
 4540 IF P=31200 THEN D1=94
 4550 IF P=31520 THEN D1=95
 4560 IF P=31840 THEN D1=96
 4570 IF P=32160 THEN D1=97
 4580 IF P=32480 THEN D1=98
 4590 IF P=32800 THEN D1=99
 4600 IF P=33120 THEN D1=100

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WHAT'S IN STORE

NEW HARDWARE ANNOUNCEMENTS*

COMPUTERS



COM/PAC

MANUFACTURER: Mattel Electronics, 5150 Rosencrans Ave., Hawthorne, CA 90250; (213) 978-5150
PRICE: \$340

The COM/PAC, the latest computer product from Mattel, marketers of the Intellivision video game machine, is a low-priced computer system. It includes the Aquarius keyboard unit with 4K RAM (expandable to 52K), built-in Microsoft BASIC, two hand controllers for game playing, a 40-column thermal printer, and a data recorder to store programs on audio cassettes.

The Aquarius keyboard has 49 calculator-style keys. It can display 256 characters, including upper- and lower-case letters, and 16 colors. Aquarius LOGO, which Mattel has promised, will come in a plug-in cartridge.



Executive 64

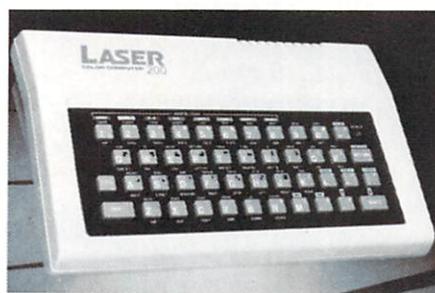
MANUFACTURER: Commodore Business Machines Inc., 1200 Wilson Dr., W. Chester, PA 19380; (215) 431-9100
PRICE: \$995

*These products have been announced by the manufacturers, but are not necessarily in the stores or even in production yet. Some are still under development. Call or write the manufacturer to find out when they will be available.

Commodore has announced a sequel to its popular Commodore 64—the Executive 64. The new portable, designed primarily for the traveling businessperson, has 64K RAM, a detachable keyboard with upper- and lower-case capability, a built-in, 6-inch color monitor, and a built-in disk drive with 170K capacity. The new unit weighs 27.6 pounds and measures 5-by-14½-by-14½ inches. This briefcase-size computer is fully compatible with VIC-20 and Commodore 64 peripherals, including the VIC modem for telecommunications. A regular monitor and printer can be hooked into the unit.

Laser 200

MANUFACTURER: Video Technology Inc., 2633 Greenleaf, Elk Grove Village, IL 60007; (312) 640-1776
PRICE: \$100



Hong Kong-based Video Technology has manufactured products for American marketers before, but the Laser 200 marks its first brand-name entry into the United States.

The Laser 200 has the earmarks of a start-up computer, with rubber "chiclet" keys, and a "goof proof" keyboard that beeps when you make an entry. Like the Timex Sinclair 1000, the Laser 200 features single-stroke key-word entries. To enter a command such as RESTORE, you merely type "R." The Laser 200 comes equipped with only 4K RAM, but is expandable to 16K or 64K with expansion modules. You can hook the Laser 200 up to a monitor or a TV, to a regular cassette recorder, and to a printer or a modem.

NEC PC-8201

MANUFACTURER: NEC Home Electronics U.S.A., 1401 Estes Ave., Elk Grove Village, IL 60007; (312) 228-5900
PRICE: \$799

The newest portable is the NEC PC-8201, a battery-operated computer with 16K RAM, expandable to 64K.

Its sizable 32K ROM also expands to 64K. Text-editing and telecommunications software is built in, as is BASIC. However, the telecommunications software will not work without a modem, which must be acquired separately.



The screen display is LCD, the "liquid crystal" type seen on many watches and calculators. Eight lines of text, at 40 characters each, can be displayed on the built-in screen at one time. The screen's black-on-white display can be reversed to white-on-black, and the contrast can be altered to suit the user. The keyboard has 67 keys, including four separate cursor controls, and can produce both upper- and lower-case letters. The 3.8-pound portable, which measures 11½-by-8½-by-2½ inches, can be connected to a disk drive, printer, or desk-top computer, and works with either a TV or a monitor.

Tomy Tutor

MANUFACTURER: Tomy Corp., 901 E. 233rd St., P.O. Box 6252, Carson, CA 90749; (213) 549-2721
PRICE: \$150



Tomy Corp., a large toy manufacturer, is positioning its first computer as a learning tool for the "computer novice," and says that an eight-year-old can learn to use the computer without parental guidance. The 16K RAM computer is expandable to 64K, and comes with built-in BASIC and high-resolution graphics. Built-in sound channels allow for three musical tones, with a range of eight octaves per tone. The raised keys pro-

WHAT'S IN STORE

NEW HARDWARE

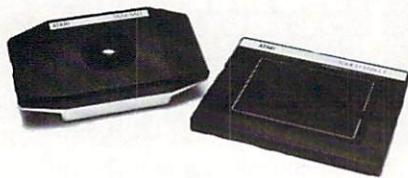
duce both upper- and lower-case characters. The Tomy Tutor requires a special cassette recorder, works with either a TV or a monitor, and will accept a speech synthesizer.

MISCELLANEOUS

Atari Touch Tablet

MANUFACTURER: Atari Inc., 1265 Borregas Ave., P.O. Box 427, Sunnyvale, CA 94086; (408) 745-2000

PRICE: \$79



By placing a stylus or finger on the touch tablet, the user may "paint" pictures and draw diagrams or scripts that will immediately appear on the computer's screen. The drawing area measures 4½-by-6 inches. Two push-button switches on the tablet and one on the stylus can be used to select options from a menu, and start or stop drawing.

Casio PT-50

MANUFACTURER: Casio, Inc., 15 Gardner Rd., Fairfield, NJ 07006; (201) 575-7400

PRICE: \$199



The Casio PT-50, a lightweight, 31-key computer instrument, simulates the sound of an organ, harpsichord, trumpet, violin, and other instruments. The unit accepts plug-in ROM cartridges, which play back prerecorded tunes. Or, the user can play his or her own music and store it in memory (on cassette tapes) for future playback. The player can back the music with any of 16 rhythms, ranging from disco to tango. No matter how slowly the music was originally recorded, the user can play it back at the proper speed by tapping one key at the desired tempo.

F.R.E.D.

MANUFACTURER: Androbot, Inc., 101 E. Daggett Dr., San Jose, CA 95134; (805) 493-1215
PRICE: \$300

F.R.E.D. (Friendly Robot Educational Device), a junior-size member of Androbot's line of personal robots, can be mobilized by a home computer—or by a remote infrared controller. Using a computer, you write a program in a specially developed LOGO-like language, and transmit the information to the robot via the controller. Using just the controller, you use the keypad to control the robot.



F.R.E.D. comes with a mini-Androwagon, so he can transport small items from room to room. With his drawing pen attached, F.R.E.D. will follow preprogrammed steps to create geometric shapes on paper. And when he's moving around on a tabletop, mechanical sensors will prevent him from slipping over the edge. Androbot says future software will include a voice synthesizer that allows for user-programmable speech.

MBX Expansion System

MANUFACTURER: Milton Bradley; marketed by Texas Instruments, P.O. Box 53, Lubbock, TX 79408; (800) 858-4565
PRICE: \$129

The MBX Expansion System includes a 64-position membrane keypad, built-in electronic speech synthesis and voice recognition, and a microphone that allows users to give verbal instructions to the computer. The system will work only with the TI 99/4A computer. Texas Instru-



ments will also market 10 Milton Bradley game and educational software packages for the MBX.

Pro-Tech Locking Stands

MANUFACTURER: Seagull Enterprises, 88 W. Britannia St., Taunton, MA 02780; (617) 823-9684
PRICE: \$165



These locking stands are designed to protect Apple computers from tampering and theft. They secure the computer itself, up to three disk drives, and any type of monitor or TV, with a rear-locking system. The locking stands are made of steel, and are color-coordinated with Apple computers. Monitors are secured to the stand with a 22-inch steel cable. A Pro-Tech Security Pad (\$99) is available to anchor your printer to a table.

Surge Sentry

MANUFACTURER: RKS Industries, 4865 Scotts Valley Dr., Scotts Valley, CA 95066; (800) 892-1342; from California (408) 438-5760
PRICE: \$89 (and up)

Electrical power surges can wreak havoc with your computer, destroying data in memory or even burning out chips. Surge Sentry, which simply plugs into an outlet, is designed to protect your microcomputer from these power surges, drops, and any electrical "noise." An indicator light tells you that the device is working properly. Surge Sentry is backed with a one-year "no questions asked" warranty. Call toll free for information about the entire RKS line.

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Save now. Build the H-100 kit, a computer that will keep pace with technology for years to come.

Advanced 16-bit computing at a kit price! With most circuit boards already pre-wired, H-100 is our easiest computer kit. And our manuals ensure that "We won't let you fail!"

Dual microprocessors deliver 16-bit speed and 8-bit compatibility. The industry standard S-100 card slots allow a host of peripherals and memory expansion to 768K RAM.

A high-density (320K) 5.25" drive is standard. Powerful options include an internal multi-megabyte Winchester drive (available soon).

See the world's first 16-bit/8-bit computer kit, plus peripherals and

software...at your Heathkit Electronic Center. Or mail the coupon today for a FREE Heathkit computer catalog!

H-100 SERIES COMPUTER SPECIFICATIONS:

USER MEMORY:

128K-768K bytes*

MICROPROCESSORS:

16-bit: 8088

8-bit: 8085

DISK STORAGE:

Built-in standard

5.25" disk drive,

320K bytes/disk

KEYBOARD:

Typewriter-style,

95 keys, 13

function keys,

18-key numeric pad

GRAPHICS:

Always in graphics mode.

640x225 resolution;

up to eight colors

are available**

*128K bytes standard.

**Optional.

COMMUNICATIONS:

Two RS-232C Serial Interface Ports and one parallel port

DIAGNOSTICS:

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AVAILABLE SOFTWARE:

Z-DOS (MS-DOS)

CP/M-85

Z-BASIC Language

Microsoft BASIC

Multiplan

SuperCalc

WordStar

MailMerge

Data Base

File Manager

Most

standard

8-bit CP/M

Software

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WHAT'S IN STORE

WHAT'S IN STORE NOVELTIES



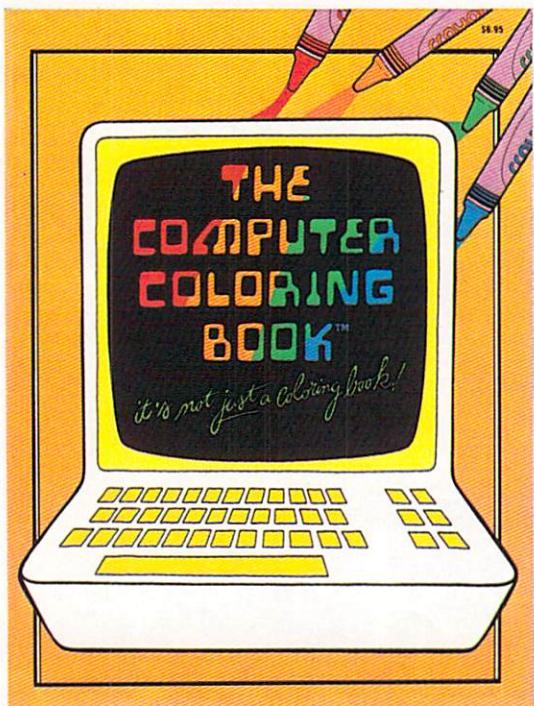
COMPUTER COZIES

Yesterday's tea cozy has found its modern-day successor in these quilted computer covers. Handmade of a washable cotton-poly blend, the covers can be made to fit any computer component—video recorders, too—and they're available in six colors. Prices begin at \$20 to cover a single component, and go to \$50 for a set. Order from Covers A Lot, P.O. Box 369, La Honda, CA 94020.



TIMEX CONSOLATION

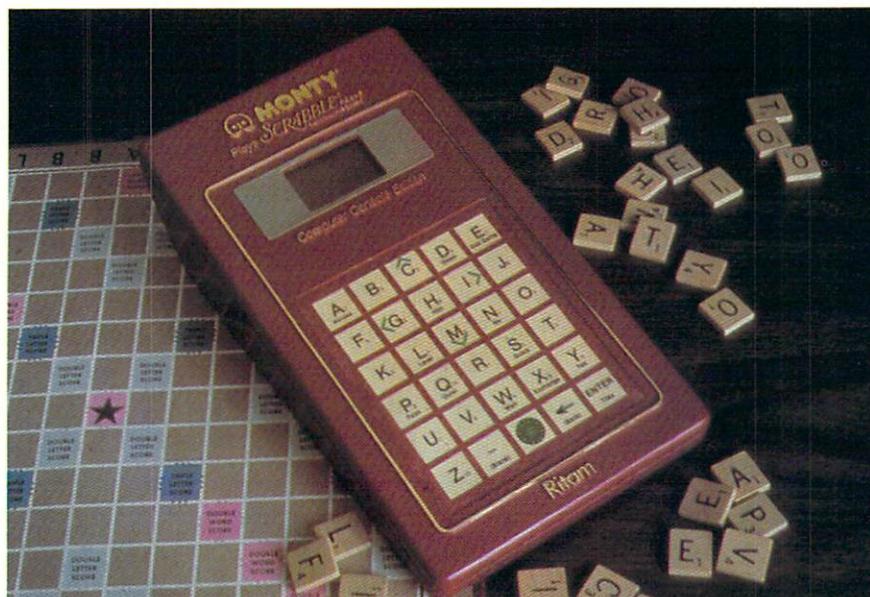
Timex users who wish their computers were more substantial and more stable will take heart with their TS 1000 installed in this sturdy plastic console. The Computer Control Center, from Timeworks, is a strong, molded-plastic unit, which holds keyboard, TV set, RAM modules, and up to five cassette tapes. Messy cords are neatly concealed underneath. Also, the center is equipped with an on/off switch through which you can route the power cable of your Timex, thereby eliminating all that endless plugging-in and unplugging. The Control Center is available for \$29.95 at many computer stores, and through the manufacturer: Timeworks, Inc., P.O. Box 321, Deerfield, IL 60015; (312) 291-9200.



A GUIDE OF A DIFFERENT COLOR

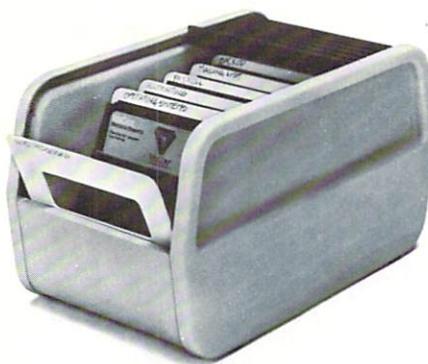
How-tos, guidebooks, and glossaries proliferate like space invaders in an arcade game. But *The Computer Coloring Book* stands out as a cheerful, inviting introduction to the world of computers. Easy-to-understand definitions of computer jargon accompany amusing and illustrative line drawings to help young users develop a rudimentary understanding of the computer. Available for \$6.95 at most major book stores or directly from the publisher: The Computer Language Company, 140 W. 30th St., New York, NY 10001.

LETTERS & NOTIOMS



A NEW PLAY ON WORDS

Scrabble games in which one angry family member hurls board- and bitty-pieces into the air in frustration will be a thing of the past with this new computerized unit by Ritam. Affectionately named Monty, with a 12,000-word vocabulary and an elephant's memory, its small proportions (twice the size of a floppy disk) facilitate scrabble play just about anywhere. You can play him alone or with others, at a variety of skill levels. And his vocabulary can be expanded with the addition of one or two advanced modules (\$29.95 each). Not recommended for those who like to throw things in frustration, Monty retails for about \$150 at department stores across the country. Or you can contact the manufacturer: Ritam Corp., P.O. Box 921, Fairfield, IA 52556; (800) 247-0043.



LOCK AND ROLL

Disk files come and disk files go. This particular version borrows a bit of the classical motif with its brown plastic roll top. The beige plastic file holds 100 disks, is outfitted with 10 dividers to further organize your software library, and comes with or without a security lock. Available for \$36 or \$46 (with lock) at many computer stores, or through the manufacturer: MicroComputer Accessories, 1545 Pontius Ave., Los Angeles, CA 90025; (213) 477-4216.

SCREEN GEMS

When everyone else in the office is boasting about the graphics capabilities of their microcomputers, you can show off with a display on your own very mini-micro. This desk organizer is a heavy-duty plastic replica of a computer keyboard and monitor. The screen holds photos of family, friends, and favorite supervisors; the caddy organizes pencils, small notepads, paper clips, and other desk miscellany. The Compu-Caddy, Item 7805, is available for \$14.98, plus \$3.95 shipping and handling from Taylor Gifts, 355 E. Conestoga Rd., Box 206, Wayne, PA 19087; (215) 293-9306.



WHAT'S IN STORE

SOFTWARE GUIDE

QUICK TAKES ON SOFTWARE— NEW AND NOTEWORTHY

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Following the chart are more detailed reviews of several of the programs.

Here's a rundown of the ratings categories and what they mean: **O** = Overall performance, and refers to the software's performance given the limitations and capacities of the particular computer for which it is intended; **D** = Documentation, or the instructions and literature that accompany a program; **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users; **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities; **EU** = Ease of use, after the initial learning period, which varies from computer to computer; **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS & HOME MANAGEMENT

Title Manufacturer Price	Brief Description	Hardware/ Equipment Required	Backup Policy	Ratings					
				O	D	EH	GQ	EU	V
THE HOME ACCOUNTANT Continental Software 11223 S. Hindry Ave. Los Angeles, CA 90045 (213) 417-3003 \$150 (IBM PC) \$74.95 (all others) ©1982	Keeps track of 6 checking accounts, cash accounts, 100 budget categories. Comprehensive finance package takes considerable time to master.+	Apple II/Ile, 48K disk; Atari 400/800, 48K disk; Commodore 64, disk; IBM PC, 128K disk; TRS-80 III/IV, 48K (2) disks	Defective disks replaced free w/in 90 days; \$20 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	n/a	D	★ ★
NODVILL DIET PROGRAM Nodvill Software 24 Nod Rd. Ridgefield, CT 06877 (203) 431-6449 \$69.95 ©1982	Helps plan meals on the basis of family members' daily adult allowances, recommended caloric intake, and nutritional requirements. Program includes listing of nutritive values of common foods.	TRS-80 I/III, 48K disk	Defective disks replaced free.	★ ★ ★	★ ★ ★	★ ★ ★	n/a	A	★ ★
PAGEMATE AB Computers 252 Bethlehem Pike Colmar, PA 18915 (215) 822-7727 \$40 ©1980	Affordable, easy-to-learn, easy-to-use word processor features complete line of functions, including full editing, formatting, right- and left-margin justification.+	Commodore 64, disk or cassette; VIC-20, 16K disk or cassette	Defective material replaced free; \$5 fee if user damaged.	★ ★ ★	★ ★ ★	★ ★ ★	n/a	E	★ ★ ★ ★
QUICK FILE II Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (408) 996-1010 \$100 ©1982	Easy-to-learn, unusually easy-to-implement file program facilitates organization, sorting, and retrieval of any sort of information.	Apple IIe, 64K (2) disks	Defective disks replaced through dealer; backup disks provided.	★ ★ ★	★ ★ ★	★ ★ ★	n/a	A	★ ★ ★ ★
VU-CALC Timex Computer Corp. Waterbury, CT 06725 (800) 248-4639 \$19.95 ©1982	Spreadsheet program simulates ledger page. Performs automatic readjustments and computations. Good for accounting, budgeting, and business inventory.+	TS 1000, 16K cassette	Defective cassettes replaced free w/in 90 days.	★ ★ ★	★ ★ ★	★ ★ ★	n/a	A	★ ★ ★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ★ Poor; ★★ Average; ★★★ Good;
★★★ Excellent; n/a Not applicable; E Easy; A Average; D Difficult; + Longer review follows chart

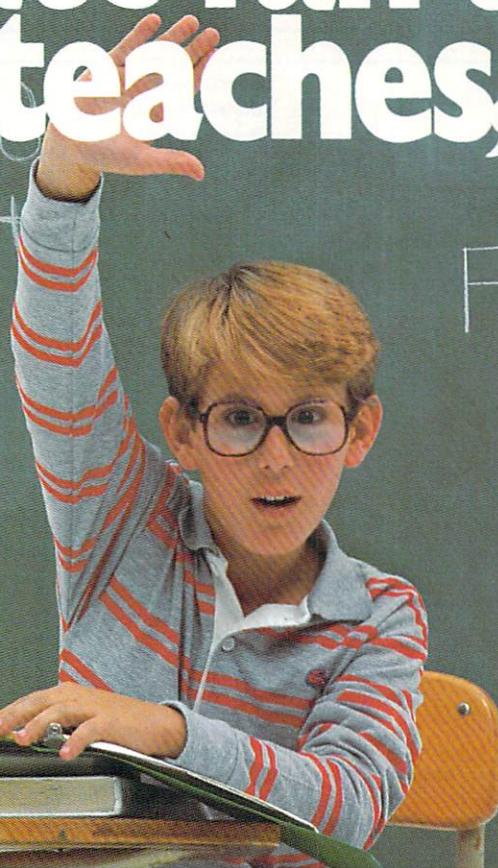
What's fun to do and teaches, too?

DUE M
ASIC II
CHAPTERS 1-10
WRITTEN pg 34

*Reminder

Parental Permission
slips for field trip
due Thursday

Final Book Rep
Due Friday



That's an easy one: HesWare™ educational software.

The children with the most answers in school are usually the children who enjoy learning.

HesWare helps develop your child's interest in learning by making it fun. And along the way, develop familiarity and proficiency with computers—a skill that is becoming more and more essential to success.

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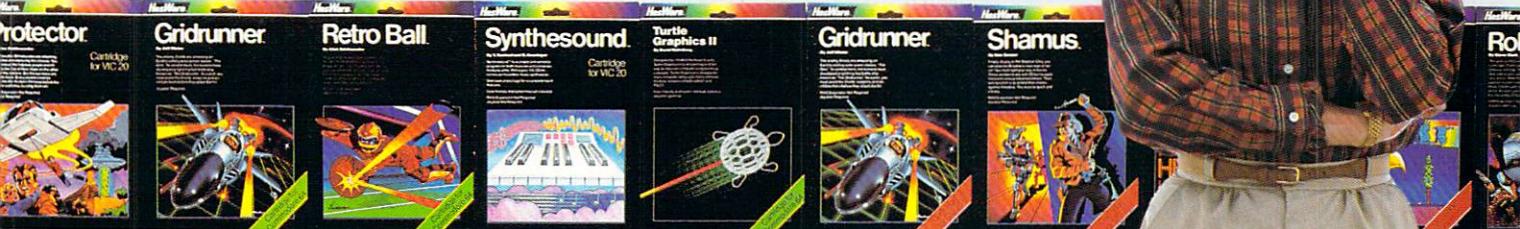
It's not expensive to give your child a headstart on the future. HesWare programs are available for most popular home computers, including the Commodore VIC 20™, Commodore 64™, Atari®, and IBM®.

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800-227-6703 (in California 800-632-7979) Dept. C20

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HesWare



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WHAT'S IN STORE

SOFTWARE GUIDE

EDUCATION/FUN LEARNING

Title Manufacturer Price	Brief Description	Hardware/ Equipment Required	Backup Policy	Ratings				
				O	D	EH	GQ	EU
ALIENCOUNTER and FACEFLASH EduFun Division Milliken Pub. 110 Research Blvd. St. Louis, MO 63122 (314) 991-4220 \$29.95 cassette \$32.95 disk ©1982	Counting and number-recognition skills taught in two lively, colorful games. Kids land correct number of aliens on earth in one, and count faces that flash on screen in the other.	Apple II/II+ /Ile, 48K disk; Atari 400/800, 16K cassette, 32K disk	Defective material replaced free w/in 30 days; \$10 fee for 12 months thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E ★ ★
ALL ABOUT WHAT YOU READ Milton Bradley 443 Shaker Rd. East Longmeadow, MA 01028 (413) 525-6411 \$39.95 ©1983	Reading lessons teach topic-sentence and main-idea recognition. Skills taught in dry, unimaginative format.	Apple II/II+ /Ile, 48K disk	Defective disks replaced free; backup copies available for \$21 fee.	★ ★	★ ★	★ ★	★ ★	A ★
ALPHA/VOWEL TUTOR Softsync, Inc. 14 East 34th St. New York, NY 10016 (212) 685-2080 \$14.95 ©1982	Two simple programs give kids, 4-9, practice in alphabet and vowel recognition.	TS 1000, 16K cassette	Defective cassettes replaced free.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E ★ ★
ALPHABET BEASTS & CO. Software Productions 2357 Southway Dr. Columbus, OH 43221 (614) 486-3563 \$29.95 ©1983	Alphabet and number-recognition, prereading skills, and fundamental keyboard use taught in graphically appealing programs.	Apple II/II+ /Ile, 48K disk	Defective disks replaced free; user makes backup copy.	★ ★	★ ★	★ ★	★ ★	E ★ ★
DELTA DRAWING Spinnaker Software 215 First Ave. Cambridge, MA 02142 (617) 868-4700 \$44.95 ©1982	Teaches programming fundamentals through easy-to-master, dynamic graphics package. Users draw, then view corresponding program, or they can first write a program to create corresponding visuals.†	Apple II+ /Ile, 48K disk; IBM PC, 64K disk; IBM requires color card	Defective disks replaced free w/in 30 days; \$5 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A ★ ★
HICKORY DICKORY DOCK and BAA BAA BLACK SHEEP Thorn EMI 1370 Ave. of the Americas New York, NY 10019 (212) 977-8990 \$29.95 ©1982	Pictures jumbled into puzzles, require logic to unscramble. Sliding degrees of difficulty allow any youngster to hone puzzle-solving skills, although it is best-suited and most exciting to 5-10 year olds.	Atari 400/800, 16K cassette; joysticks required	Defective cassettes replaced free.	★ ★	★ ★	★ ★	★ ★	E ★
MICROZINE Wizware/Scholastic 730 Broadway New York, NY 10003 (212) 505-3000 (8 issues/year) \$39.95 per issue ©1983	Diverse package includes interactive adventure story, simulated interview, graphics program that teaches programming basics, and computerized 3 × 5 card file.†	Apple II/II+ /Ile, 48K disk; paddles optional	Defective disks replaced free w/in 60 days; \$5 fee for 10 months thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A ★ ★
PAINT Reston Publishing Co. 11480 Sunset Hills Rd. Reston, VA 22090 (703) 437-8900 \$39.95 ©1982	Rich graphics package exploits Atari's brilliant color capacities with variety of paint options. Package includes well-written, comprehensive guide book.†	Atari 800, 48K disk; joystick required	Defective disks replaced free; \$7.50 fee if user damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E ★ ★
SPILLS AND FILLS Creative Software 230 E. Caribbean Dr. Sunnyvale, CA 94089 (408) 745-1655 \$29.95 ©1983	Computer-simulated water play, accompanied by water sounds, helps teach spatial relations and concepts of volume.†	VIC-20, cartridge; joystick required	Defective cartridges replaced free.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E ★ ★

RATINGS KEY O Overall performance; D Documentation; EH Error handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good;
 ★★★ Excellent; n/a Not applicable; E Easy; A Average; D Difficult; + Longer review follows chart

GAMES

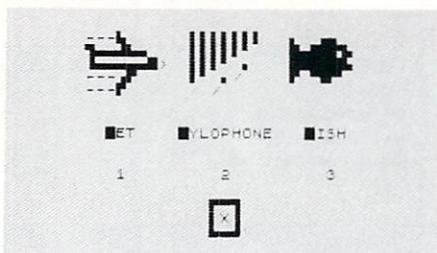
Title Manufacturer Price	Brief Description	Hardware/ Equipment Required	Backup Policy	Ratings					
				O	D	EH	GQ	EU	V
CHOPPLIFTER Creative Software 230 E. Caribbean Dr. Sunnyvale, CA 94089 (408) 745-1655 \$29.95 ©1982	Guide helicopter past enemy tanks, airplanes, and satellites into foreign embassy compound to rescue hostages in this easy-to-learn, moderately interesting arcade game.	VIC-20, cartridge; joystick required	Defective cartridges replaced free.	★ ★	★ ★	★ ★	★ ★	E	★ ★
CROSSFIRE Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 \$34.95 (cartridge) \$29.95 (all others) ©1981	Shoot down aliens attacking from up and down, right and left, in this easy-to-learn, difficult-to-master, but unremarkable arcade game.	Apple II/II +/Ile, 48K disk; Atari 400/800, cartridge, 16K cassette, 48K disk; VIC-20, cassette; IBM PC, 48K disk; joystick optional	Defective material replaced free w/in 90 days; \$5 fee thereafter.	★ ★	★ ★	★ ★	★ ★	A	★ ★
DEMON ATTACK Imagic 981 University Ave. Los Gatos, CA 95030 (408) 399-2200 \$34.95 ©1982	Steer ships over lunarscape to fend off and shoot down waves of alien creatures in this addictive arcade game.	Atari 400/800, cartridge; VIC-20, cartridge; joystick required	Defective cartridges replaced free w/in 2 years.	★ ★	★ ★	★ ★	★ ★	E	★ ★
ESCAPE FROM RUNGISTAN Sirius Software, Inc. 10364 Rockingham Dr. Sacramento, CA 95827 (916) 366-1195 \$29.95 ©1982	Use your wits and arcade skills to escape from prison and hostile foreign country. Takes patience to solve puzzles in this exciting text adventure/arcade game hybrid.†	Apple II/II +/Ile, 48K disk	Defective disks replaced free; \$5 fee if user damaged.	★ ★	★ ★	★ ★	★ ★	A	★ ★ ★
FLIGHT SIMULATOR Microsoft Corp. 10700 Northup Way Bellevue, WA 98004 (206) 828-8080 \$49.95 ©1982	Learn to launch, land, and fly an airplane while having a lot of fun with this educational, real-life simulation of flight.†	IBM PC, 64K disk; IBM requires color card.	Defective disks replaced free w/in 1 year.	★ ★	★ ★	★ ★	★ ★	A	★ ★ ★
GUESS WHAT'S COMING TO DINNER Educational Software 4565 Cherryvale Ave. Soquel, CA 95073 (408) 476-4901 (800) 692-9520 \$24.95 ©1983	Guide the snake across the screen. As it consumes flies, frogs, and mice in its path, it gets longer and more difficult to maneuver.	Atari 400/800, 16K cassette, 32K disk; joystick required	Defective material replaced free.	★ ★	★ ★	★ ★	★ ★	A	★ ★
HUNT THE WUMPUS Texas Instruments P.O. Box 53 Lubbock, TX 79408 (800) 858-4075 \$24.95 ©1980	Search for the Wumpus' lair, while avoiding his hungry jaws and the steamy slime pit, in this arcade game best suited for younger, less-demanding audiences.	TI-99/4A, cartridge; joystick optional	Defective cartridges replaced free w/in 90 days; \$10.25 fee thereafter.	★ ★	★ ★	★ ★	★ ★	E	★ ★
THE MISSING RING Datamost, Inc. 8943 Fullbright Ave. Chatsworth, CA 91311 (213) 709-1202 \$29.95 ©1983	Roam uncharted corridors of an enchanted palace in search of magical rings. Fend off monsters, acquire new powers, learn magic spells in this stimulating, simple introduction to text adventures, with graphics.	Apple II/II +/Ile/III w/emulator, 48K disk	Defective disks replaced free.	★ ★	★ ★	★ ★	★ ★	E	★ ★ ★
PINBALL CONSTRUCTION SET Electronic Arts 2755 Campus Dr. San Mateo, CA 94403 (415) 571-7171 \$40 ©1983	Design, "build," modify, then play electronic pinball game. Use prefab or original elements to create endless variety of pinball fields. Innovative program appealing to all ages.†	Apple II/II +/Ile, 48K disk; Atari 400/800, 48K disk; joystick required	Defective disks replaced free w/in 90 days; \$7.50 fee thereafter.	★ ★	★ ★	★ ★	★ ★	A	★ ★ ★
QIX Atari, Inc. 1312 Crossman Ave. P.O. Box 61657 Sunnyvale, CA 94086 (800) 538-8543 \$44.95 ©1983	Trap the whirling Qix by carving out territories of your own in this game of skill and strategy. Easily learned, more difficult to master.	Atari 400/800, cartridge; joystick required	Defective cartridges replaced free.	★ ★	★ ★	★ ★	★ ★	E	★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ★ Poor; ★★ Average; ★★★ Good;
 ★★★ Excellent; n/a Not applicable; E Easy; A Average; D Difficult; + Longer review follows chart

WHAT'S IN STORE

SOFTWARE REVIEWS

EDUCATION/ FUN LEARNING



Alpha/Vowel Tutor

HARDWARE REQUIREMENTS: TS 1000, 16K cassette
MANUFACTURER: Softsync
PRICE: \$14.95

Does that "N" in a box at the bottom of the screen belong to picture #1, labeled—REE, picture #2,—IRL, or picture #3,—OSE? The answer, of course, is 3. If you had watched closely, you would have seen that little nose flash on and off when the face appeared on the monitor. You could be sure the picture didn't represent a "head" or "chin" or "face."

This "computer tutor" consists of two phonics education games for ages 4 to 9: "Alpha Tutor," which covers the sounds that words begin with, and "Vowel Tutor," which deals with long and short vowel sounds.

Both programs make good use of the Timex Sinclair's limited graphics capabilities. Those limitations, however, do prevent the younger children from playing without help, because some pictures are not so easily identified. My son, a 3½-year-old prereader, thought a car was a piano: The car was a squarish silhouette with block wheels that looked very much like a closed grand piano.

The child must enter the *number* of the correct answer. This may cause trouble for your kids—pushing numbers instead of letters in a game that proposes to teach reading skills is confusing. Since the program stops running if a letter is entered by mistake, you may want to tape paper across the keyboard, leaving only the number keys available (cut out a notch for the ENTER key). The correct word is spelled out regardless of the child's choice: a correct answer and the word is underlined in stars.

The pictures in the *Alpha/Vowel* games are mixed randomly; there are enough of them to keep the game from being too repetitive and

dull. The games are simple enough to capture a child's attention, and varied enough to hold it.

—SHARON AKER

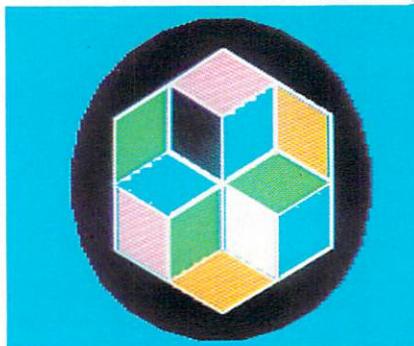
Delta Drawing

HARDWARE REQUIREMENTS: Apple II+/Ile, 48K disk; IBM PC, 64K disk
MANUFACTURER: Spinnaker Software
PRICE: \$44.95

A package that makes good use of Apple's graphics capabilities, *Delta Drawing* is almost as entertaining for experienced users as it is for computer newcomers. An excellent, thorough manual shows, step-by-step, how to create both simple and complex drawings. While the instructions are written for older children and adults, less able readers will get by with a little help from friends.

Drawings are remarkably easy to execute: the cursor, or "delta," moves around the screen in response to single-key commands. Simple forms, such as squares, can be repeated many times in slightly different locations and at slightly different angles. Thus, extremely complex pictures can be created right from the start. A color monitor really brings out the full potential of the software: lines and areas within can be colored for a stunning effect.

Kids derive a terrific sense of accomplishment from creating their own visuals with *Delta Drawing*. "Once you get into it you find it hard to stop!" one child exclaimed.



The computer keeps track of your drawing in a program, which can be called up and easily revised. Edit parts of it or redo the entire thing, go back to the graphics, and see the result! Or write the program first, and view the corresponding graphics later. Older children and adults are thus introduced to basic programming concepts—the way commands produce certain effects, and the way changes in commands affect the en-

tire program. Even younger children seem to catch on quickly.

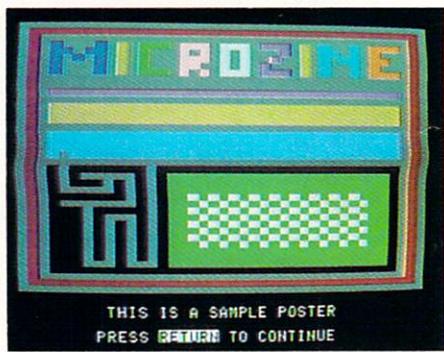
One of my few quibbles with the software was that I found users were confused by the commands. For example, typing "E" erases your last drawing move, while typing CTRL-E erases all your moves and thus the whole picture.

Delta Drawing is such a rich program that it will take a while for you and your family to take advantage of all it has to offer. At the same time, the young and inexperienced can begin immediately. It's sophisticated software—even for the unsophisticated.

—TONY MORRIS

Microzine

HARDWARE REQUIREMENTS: Apple II/II+/Ile, 48K disk
MANUFACTURER: Wizware/Scholastic
PRICE: \$39.95



THIS IS A SAMPLE POSTER
PRESS RETURN TO CONTINUE

"It's 3:00 a.m. . . . suddenly you're dripping with sweat," begins "Haunted House," the first of four programs on *Microzine*, Scholastic's new "interactive magazine on a disk."

You've just had a dream about a friend who is trapped in a haunted house and needs help. It's up to you to determine what direction the story takes from there. It's like a multiple-choice version of a text-adventure game. The sound effects and graphics are clever, the instructions clear. The endings are occasionally startling—characters sometimes wind up in the insane asylum or jail—but kids don't mind. They're thoroughly absorbed in the challenge of discovering all the possible twists and turns to the story.

Another provocative use of the computer's potential is "Ask Me," in which you become an interviewer, with Robert McNaughton, who played Eliot's older brother in *E.T.*, as your subject.

The third program, "Poster" is a simple, lo-res graphics package that



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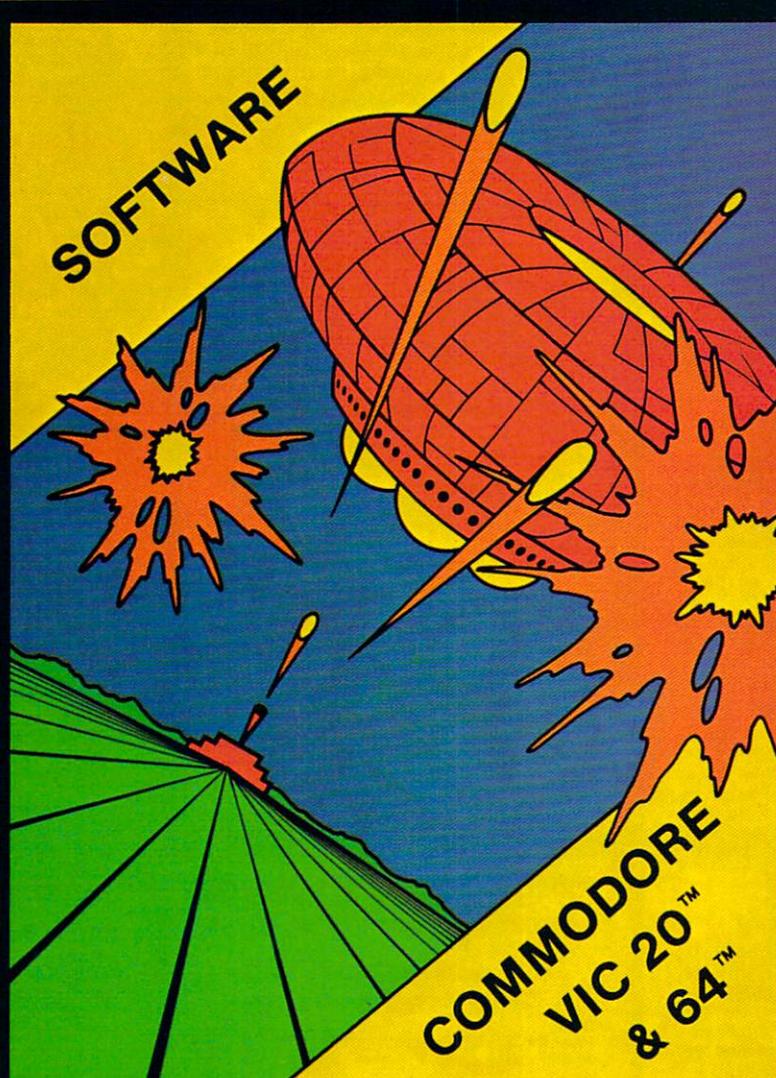
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WHAT'S IN STORE

SOFTWARE REVIEWS

allows you to draw pictures with simple commands ("R": right; "L": left; "U": up; and "D": down), label the pictures, and save them on a disk. You get a choice of colors, brush widths, and drawing speeds. You can even choose one of several sounds to accompany your brush strokes! The manual is written clearly enough for children 10 years old and above.

Since the computer keeps track of your commands in a brief program, it's possible to list the program, edit it directly, and then observe the difference in the picture. This feature makes for a very gentle introduction to programming for children (or adults). By itself, this simple graphics program is worth the cost of the entire disk.

Finally, "Secret File" allows kids to maintain, edit, and sort data in a simulated 3×5 card file. It's a fun and practical way to learn how to organize and order information logically.

All in all, this package covers a lot of ground. Its programs are diverse and substantial—with enough lasting value that it's unlikely to be left on the shelf after a few uses.

—TONY MORRIS

Paint

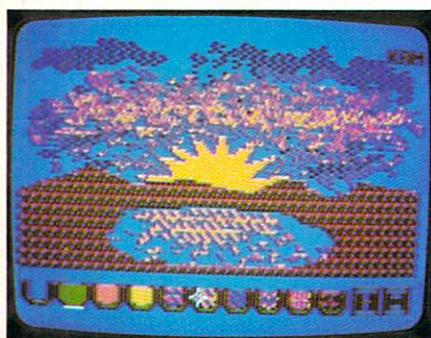
HARDWARE REQUIREMENTS: Atari 800, 48K disk

MANUFACTURER: Reston Publishing Co.

PRICE: \$39.95

A joy to learn, simple to operate, *Paint* can make a microcomputer Michelangelo out of anyone.

The highly acclaimed piece from the Capital Children's Museum allows you and your family to execute colorful creations on the screen and then save them on a disk. Brush widths, color combinations, and patterns such as plaids and stripes can all be interchanged with a flick of the joystick and a press of the trigger button. Other features of this dramatic



program include a fill function that colors portions of your *chef d'oeuvre*, and commands that enable you to magnify it to exotic proportions. The "help menu" is thorough and explicit, the commands unambiguous.

Paint's documentation is impressive. My wife, an art teacher, found the 147-page booklet to be an accurate, interesting introduction to computers and art history. *Paint* can unharness the artistic temperament in just about anyone. It is a truly dynamic graphics program that stretches Atari's terrific capacities to the limit.

—DEAN VAN DE CARR

Spills and Fills

HARDWARE REQUIREMENTS: VIC-20 cartridge

MANUFACTURER: Creative Software

PRICE: \$29.95



Everyone knows that most kids love playing with water. Many preschools and kindergartens have a water table, a special area in which children can fill, spill, mix, and measure to their hearts' content. Educators appreciate such play as a valuable introduction to volume concepts and spatial relationships. Creative Software has made it possible for youngsters to engage in a simulation of this pastime using the family computer!

Using a joystick, kids select a master beaker from several available sizes. With this they fill the containers scooting by on a conveyor belt, accompanied by water sounds. Participants quickly learn that if the selected master beaker is too large, they will spill more than fill. It actually teaches concepts that I had never expected taught on a computer.

Five-year-old Molly pointed out to her older brothers that the master beaker must go over the other beakers on its way to the spigot for a refill. Describing the requisite position of the master beaker for it to be

filled by water, she proclaimed, "It has to be right 'zactly under them."

Playing with the real thing, of course, is invaluable and could never be substituted by computer simulation. However, when I took the program to a computer class I was conducting for preschoolers and their parents, both kids and adults agreed that the program is a nifty (not to mention drier) way of learning about spatial relationships and volume.

—BETSY BYRNE

GAMES

Escape from Rungistan (Adventure)

HARDWARE REQUIREMENTS: Apple II/II+/Ile, 48K disk

MANUFACTURER: Sirius Software

PRICE: \$29.95

Thrown into a rat-infested jail in the country of Rungistan, you have very little besides your wits to help you escape. Never underestimate your resources; look for a way out in everything you encounter—from bribes to worthless-looking objects. Within a few short minutes (or hours, depending on your imagination), you'll have escaped from prison and begun your trek to freedom. Along the way, you'll have to span great bridges, survive vicious bear attacks, and ski through mountain forests—an odyssey that could take hours.

As text adventures go, *Escape from Rungistan* is not as tough as it may seem, although more than half of our play testers, mostly the very young and arcade game-inclined, gave up after less than an hour of play. The game is a series of verbal exchanges with the computer. For instance, you type instructions such as SAY GUARD, which means "call the guard." Once you've mastered the game's language and grown accustomed to its logic, it can be an exhilarating experience, especially if you enjoy unraveling puzzles, mystery novels, or movie plots. In addition to the brain work, you must employ arcade skills such as skiing through a forest or piloting a plane toward freedom.

Some words of advice: every time you progress (escape from jail, cross a chasm), be sure to save the game onto your disk. You can't imagine the frustration of having successfully completed a downhill ski run, only to "die" and have to begin in that horrible jail again! —JAMIE DELSON

WHAT'S IN STORE

SOFTWARE REVIEWS

Flight Simulator (Real-life Simulation)

HARDWARE REQUIREMENTS: IBM PC, 64K disk w/color card
MANUFACTURER: Microsoft Corp.
PRICE: \$49.95



Watch those revs. Ease the throttle. Keep the nose centered down the runway. Give it a little more power. Pull back on the stick . . . You're airborne! Watch your altitude; even the smallest miscalculation and you'll lose control of your aircraft.

This sophisticated program is the yardstick against which all hand/eye coordination games should be measured. In addition to all the usual arcade skills, it requires concentration and fast thinking. Taking off and landing are tough achievements, but the program repays user persistence like no other arcade game. It also fulfills our timeless fantasies of flight. Beautiful high-resolution graphics depict everything from rain and fog to major U.S. airports.

Flight Simulator will continue to challenge even the most experienced pilots. After having mastered the fundamentals of flight, you graduate to "British Ace." Then, you're a World War I combat pilot besieged by enemy pilots in your mission to bomb the opposition's installation. Whether or not you reach the elite corps of fighter pilots in "British Ace," you'll find learning how to land and launch, how to soar above the clouds—an exciting experience.

—JAMIE DELSON

Pinball Construction Set (Skill/Arcade)

HARDWARE REQUIREMENTS: Atari 400/800, 48K disk; Apple II/II+/-Ile, 48K disk
MANUFACTURER: Electronic Arts
PRICE: \$40

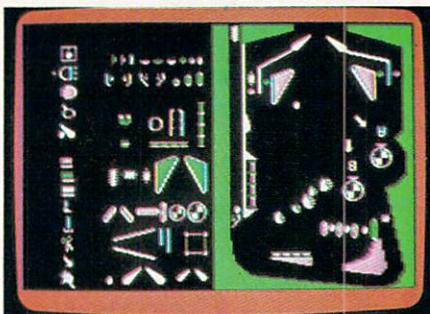
Enjoy the dynamic experience of pinball, with all its sights and sounds electronically recreated in two di-

mensions with Bill Budge's *Pinball Construction Set*. You create your own pinball table—complete with the usual bumpers, kickers, targets, and slingshots. Other gadgets like spinners, rollovers, and drop targets enhance the game's excitement and help you increase your score. Color the entire field with your electronic paint brush, change the weight of the ball, designate the value of the bumpers, and give them extra bounce—all as you wish.

Using a finger-shaped cursor, you combine pieces into a workable pinball playing field. Test and revise it to eliminate the bugs, and of course save your masterpiece for later use.

It's like an electronic Erector Set, only easier to use and a lot more fun. Perhaps best of all, *Pinball Construction Set* is suitable for all ages, from young children interested in creating their own forms with the program's wonderful shape-making and paint functions, to more sophisticated players who spend hours refining their fantasy-game boards.

Pinball play testers of all ages often worked together to improve upon previous designs. In particular, youngsters spent many quiet hours of play time creating magnificent game boards that they displayed with pride.



Typical arcade games produce very little besides improved trigger-finger response, perhaps. This innovative game, however, created a more tangible, cooperative sense of achievement in participants. Fun and stimulating for individuals or the family together, *Pinball* is one of the year's best. Watch Bill Budge for future contributions to the field.

—JAMIE DELSON

Qix (Skill/Arcade)

HARDWARE REQUIREMENTS: Atari 400/800, cartridge
MANUFACTURER: Atari
PRICE: \$44.95

If members of your family are looking for mindless, fast-paced shoot-'em-up action, stay away from *Qix* (pronounced quix or kicks). The game features a colorful, wicked whirling dervish that randomly haunts the game screen. Your aim is to trap the skittish thing in one fourth of the monitor area by closing off spaces, using the joystick as an artist's tool. A cursor on the screen indicates your drawing starting point. When closed spaces are created, a brilliant purple colors them in.

If the *Qix* touches the line you're drawing before you've completed a shape, it erases the line and you lose one of your three lives. Other little nasties, called Burning Fuses, travel along the lines you've created. You must outwit them or they'll catch up to you and destroy another of your lives.



Riskier types try to color large spaces all at once; the more cautious play it safe and fill in little square after little square in an effort to carve out 75 percent of the screen territory as their own. Each game is different.

Having filled 75 percent of the screen with your odd purple shapes, you earn bonus points and go on to a more difficult level featuring more *Qix*s and Fuses.

A nonviolent game, *Qix* is gratifying to play or watch at any age, and children often outplay adults, of course.

—ANNE KRUEGER

HOME BUSINESS & HOME MANAGEMENT

The Home Accountant

HARDWARE REQUIREMENTS: Apple II/Ile, 48K disk; Atari 400/800, 48K disk; Commodore 64, disk; IBM PC, 128K disk; TRS-80 III/IV, 2 disk drives
MANUFACTURER: Continental Software
PRICE: \$74.95; IBM PC disk: \$150

One of my recurring fantasies, usu-

ally around tax-reporting time, is that I will somehow be able to keep track of my income and expenses, compare them with a budget, and be able to get up-to-date printouts of my financial status at any time. *The Home Accountant* promises all this and more.

It will keep track of six separate checking accounts, 100 different budget categories, and your credit card transactions, among other things. You can also flag tax-deductible expenses for easy retrieval later on. With it you can print out income/expense, net worth, and budget reports, as well.

Sounds like magic, doesn't it? Beware: In spite of *The Home Accountant's* powerful capabilities, it will not perform miracles. It's up to you to make it work for you by organizing your finances first, and feeding them into the program in a coherent fashion. If you're as disorganized with your records and as much of a procrastinator as I am, this will take some time and effort.

My major reservation about this program is how difficult it is to learn to use. The instruction manual is rather poorly written; several times I had to start all over from scratch, abandoning the information I had entered earlier. Take time to learn its idiosyncrasies before you encounter them in the course of setting up your more complex system of financial records. *The Home Accountant* could work wonders, but not without a lot of effort on your part.

—DAVID WILSON

PageMate

HARDWARE REQUIREMENTS: Commodore 64, VIC-20 with 16K expansion, disk or cassette

MANUFACTURER: A B Computers
PRICE: \$40

PageMate is so easy to learn that I taught my daughter Beth how to use it while we were frying chicken for dinner one evening. In between cutting, breading, and turning, she became the first kid in her eighth-grade class to use a word processor for her homework.

Beth learned on a Commodore 64, but one of the program's most exciting features is that it works just as well on the VIC-20 (expanded to 16K), given the comparative limitations of that machine. All of *Page-Mate's* 60 commands—right-margin justification, headings, page num-

bering, easy menu selection, and full-screen editing (to name a few)—will function on any Commodore computer.

With the addition of a data-base manager, *Flex File 2*, by the same programmer, you'll be able to process form letters with *PageMate*. You can transfer, delete, append, and save text easily. Most of these operations are activated simply by pressing one key, usually the first letter of the command. For instance, to transfer text from one part of your manuscript to another, type "T." To readjust the format of a letter, type "F."

These features, as well as all the others that I didn't have space to mention, make *PageMate* a fine value at \$40. After all, a family word-processing program for a family computer should have a price that a family can afford. —BETSY BYRNE

Vu-Calc

HARDWARE REQUIREMENTS: TS 1000, 16K cassette

MANUFACTURER: Timex
PRICE: \$19.95

Among other things, spreadsheet programs facilitate accounting and any sort of finance management. They provide the user with a simulated ledger page—lots of columns, and lots of lines. The intersection of each column and line is called a cell. The user inputs one of three kinds of information into these cells—a label, a numerical value, or a formula. Labels are used to tell you what the numbers in a column or line are: PROFIT, EXPENSES, INCOME, etc. Formulas process the numbers placed in columns and rows. When you change a number, the value of every cell in which there is a number that uses that formula changes correspondingly. This makes it easy to play "what if?" For instance, "If we cut down on phone bills for a year, will we have saved enough money to get cable TV?"

Timex's *Vu-Calc* is neither as sophisticated nor as powerful or complex to learn as the bigger spreadsheets like VisiCalc, or Multiplan, but it costs a fraction of what they do. The documentation is brief, but complete and relatively easy to understand. Best of all, it utilizes the TS 1000 to do extensive computations more easily, more accurately, and faster than you could do them with paper and pencil or even with a calculator.

—DAVID WILSON



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WHAT'S IN STORE

BOOK REVIEWS

30 Computer Programs for the Homeowner, in BASIC

David Chance
Tab Books, 1982
356 pp., paperback, \$9.95

If you have a cassette-based TRS-80 Model I, III, or IV, and if you are interested in learning to use your cassette to store data files, then this book may be of interest. If you have any other hardware configuration or are not interested in cassette files, this book will not meet your needs.

30 Computer Programs contains just that, 30 programs that you can enter into your TRS-80. Chance suggests readers will have "little trouble converting them to run on other microcomputers," but offers no methods for doing so. This suggestion is extremely optimistic. Anyone who can easily translate these programs is not likely to use a book of program listings.

Every application in the book has a few sentences of introduction, a sample run, a flow chart (good idea), and the program itself. The programs do not contain exemplary screen formats or a sufficient number of remarks to assist the user, but do include unnecessary and bulky PRINT messages. In general, the programs are not written in a format that will help the novice increase his or her understanding of BASIC.

—WALTER KOETKE

Computer Confidence: A Woman's Guide

Dorothy Heller and June Bower
Acropolis Books, 1983
250 pp. softcover, \$9.95; hardcover, \$10.95

Scientists, educators, businesspeople, artists—as the personal computer industry matures, each sector of the population gets its own customized introduction to computers.

Now, it's the women's turn! *Computer Confidence: A Woman's Guide* provides an upbeat picture of the woman/computer connection.

Fusing traditional computer literacy lessons with reassuring pop psychology for the computer phobic, the book covers such topics as home computer purchasing, software applications, and programming languages. Heller and Bower discuss how to overcome computer anxiety and the dozens of interesting ways in which women use computers to make a living. Their practical dollars-and-cents appraisal of the com-

puter revolution includes a job-seeker's introduction to computer careers, and some thought-provoking self-help worksheets. Nonprogrammer types will take comfort in some of the less-technical computer-related job possibilities.

As is often the case with this kind of pep-talk introduction, things sometimes seem too good to be true. There is a side to computer literacy ignored by these optimists. Not every woman who buys a computer can write successful romance novels or invent creative educational software, as the author suggests. Also, Heller and Bower don't discuss the issue of women losing jobs to machines. These somewhat sour notes, evidently, have no place in this book, which is bound to make women and computers better friends. —ROBIN RASKIN

Microcomputers: A Parents' Guide

Kenneth Goldberg and Robert Sherwood
John Wiley and Sons, Inc., 1983
224 pp., paperback, \$8.50

The rapidly increasing number of microcomputers is producing a rapidly increasing number of experts with alarmingly divergent advice. One widely accepted and very sound principle, especially appropriate for those new to computing, is to first identify applications of interest, then locate appropriate software, and finally purchase hardware. Unfortunately, *Microcomputers: A Parents' Guide* presents buying computer hardware as the first step. A book based on this premise cannot be recommended.

Computer technology is changing so rapidly that books more than four or five years old are likely to contain very dated information, in spite of the best efforts of authors and publishers. *Microcomputers: A Parents' Guide*, published earlier this year, is an indication of just how quickly printed information becomes out of date. The section comparing new machines discusses some that are no longer available and omits the Apple IIe, Commodore 64, TRS-80 Models IV and 100, and the entire Atari XL series. And, although all of the software discussed is still available, none represents the best currently available in either subject area or price range.

Bound books will be with us for many years to come, but not as a

source of truly current information on computers and their applications at home and school. —WALTER KOETKE



The Star Wars Question and Answer Book About Computers

Fred D'Ignazio
Random House, 1983
61 pp., paperback, \$4.95

What Fred D'Ignazio's 1979 book, *Katie and the Computer*, did for the very young audience, this book attempts to do for older children. Written in a question-and-answer format, it teaches fundamental concepts about computers, and describes their history, their function, and their uses.

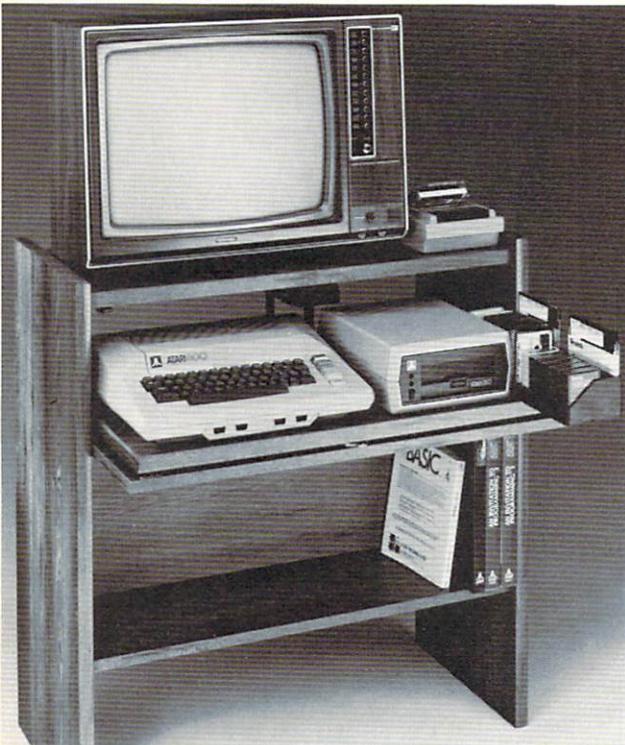
The book is simply and clearly written, and though short enough to be read in a single sitting, contains a surprising wealth of facts and information. Historical topics range from early computer scientists Charles Babbage and Lady Ada Byron to the development of the transistor and the microchip. A little programming lesson is given in the BASIC language, and some of the more abstruse terminology is explained. All sorts of computer applications are described, from games, robot control, and weather prediction to potential future applications such as artificial intelligence.

The author does not shy away from touching upon some of the more disturbing problems of the computer age. The predicament of people who find themselves out of work because of automation is discussed, and one possible solution—retraining—is put forward. The final section of the book is devoted to describing computer-related careers.

Ken Barr's illustrations are quite good, and are supplemented by a variety of photographs. Moreover, like all of Fred D'Ignazio's works, this one is notably free of any suggestion of sex-role stereotyping, and may be recommended with confidence for any preteenager. —JOHN B. JAINSCHIGG

THERE'S A COMPUTER BORN EVERY MINUTE... GIVE IT A HOME.

For \$89.95 with the CS-1632 you can house your computer, peripherals, and accessories without spending a fortune.



The CS-1632 computer storage cabinets compact yet functional design fits almost anywhere while housing your computer monitor, joysticks, software, books and peripherals all for only \$89.95.

The slide out shelf puts the computer at the right height and position for easy comfortable operation.

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To store joysticks just turn them upside down and slide them into the inverted storage rack.

Twist tabs on the back of center panel allow for neat concealed grouping of wires, while power packs rest hidden behind center panel on shelf.

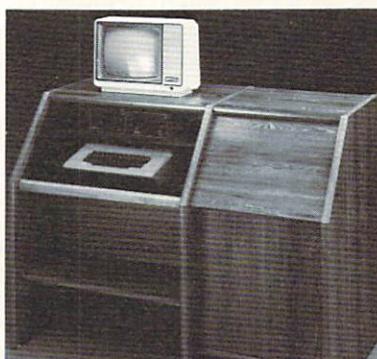
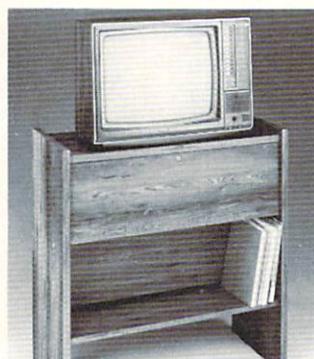
The slide out software tray has room for 14 cartridges or cassettes and up to 30 diskettes. Most brands of software will fit between the adjustable partitions with a convenient hook for the spare key at rear.

Stand fits Atari 400 & 800, Commodore 64 & VIC 20, TI 99/4A and TRS-80.

Cabinet dimensions overall 36" high x 33-7/8" wide x 16" deep.



For those with a large computer family the CS-2748 gives you all the room you need for your computer, monitor, printer, peripherals, software, etc. at a price that's hard to believe: \$299.95.



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Both the CS-1632 and CS-2748 ship unassembled in two cartons. Assembly requires only a screwdriver, hammer, and a few minutes of your time.

Choice in simulated woodgrain of warm golden oak or rich natural walnut finish.

The two slide-out shelves put the keyboard at the proper operating height while allowing easy access to the disk drives.

The bronze tempered glass door protecting the keyboard and disk drives simply lifts up and slides back out of the way during use.

Twist tabs on the back of the center panel allow for neat concealed grouping of wires while a convenient storage shelf for books or other items lies below. The printer sits behind a fold down door that provides a work surface for papers or books while using the keyboard. The lift up top allows easy access to the top and rear of the printer. A slot in the printer shelf allows for center as well as rear feed printers.

Behind the lower door are a top shelf for paper, feeding the printer, and a bottom shelf to receive printer copy as well as additional storage.

Stand fits same computers as the CS-1632 as well as the Apple I and II, IBM-PC, Franklin and many others.

The cabinet dimensions overall: 39-1/2" high x 49" wide x 27" deep.

Keyboard shelf 20" deep x 26" wide. Disk drive shelf 15-3/4" deep x 26" wide. Top shelf for monitor 17" deep x 27" wide. Printer shelf 22" deep x 19" wide.

THE PRIMER

The only way to learn to use a computer is to use one. But before you start, it's well worth asking, "What can I do with a computer?" And, "How does a computer work?"

The illustration of a computer system on the opposite page shows various pieces of equipment, referred to as hardware. To work effectively, this hardware needs step-by-step instructions, or programs. These programs are often called software. What you can do with a computer depends on the software you use.

The many uses of home computers can be broken down into several broad categories.

WHAT A COMPUTER DOES

Game Playing. Several types of games are available—arcade-style action, fantasy, adventure. Some take minutes to master; others months. Many games can be played by more than one person at a time.

Education. Whether you are learning math, French, history, or typing, these programs allow you to learn at your own pace. Programs range from question-and-answer drills to loose creative exercises. Some test logical skills, by putting you in a real-life problem-solving situation; others teach you to program by letting you draw pictures.

Paper work. When it comes to handling reams of information, the computer can't be beat. It functions as an endless supply of paper, file cabinets, and a calculator rolled into one. With an electronic spreadsheet, you can change one figure in a budget and the rest will automatically change. The ability to ask "what if?" and see immediate results has obvious time-saving benefits.

The computer is equally adept at setting up a filing system, and allows you to cross-reference data in any number of ways for easy recall.

With a word-processing program, the computer can speed up and simplify the writing process, by allowing you to change or rearrange words and paragraphs without retyping.

Information access. You can hook your home computer, via the telephone, to much larger computers at "information service" companies. This allows you to "call up" stock quotations, airline schedules, newspaper and magazine bibliographies, encyclopedias, and even games.

Also, by using the telephone lines you can hook your computer to other home computers around the country, and leave or receive mes-

sages. This practice is known as electronic mail. Several computers linked together are called a network.

Programming. It's possible to enjoy practical benefits from your computer without ever buying a commercial program—you can write your own. And, in some cases, you can adapt commercial programs to better suit your particular needs.

HOW A COMPUTER WORKS

The computer is an information-handling machine. It stores, compares, changes, and manipulates information of almost any kind at tremendously high speeds.

The computer's operating method can be boiled down to four simple steps. (1) INPUT: Instructions and information, in the form of a program and data, are entered into the computer. (2) PROCESSING: The computer executes the steps of the program. (3) OUTPUT: The results of the computer's work are made visible and available to the user. (4) STORAGE: Results can be stored and saved.

Most home computers do not come ready-made in one piece, but must be assembled from various components. Following are the components needed for each of the four operating steps, and how they work.

Input. There are four basic ways of getting a program and/or other information into a home computer.

KEYBOARD. The keyboard looks and behaves much like that of a typewriter. Some keyboards have special keys for certain computer functions, and some have a numeric keypad, much like a calculator. But on any unit, every keystroke you type goes directly into the computer's memory. That information will stay there until you delete it or turn the computer off. (You can also store, or save, that information for future use.)

CASSETTE TAPE RECORDER. You can copy a program stored on a cassette tape directly into the computer's memory. Regular tape recorders and cassettes can be used with most home computers, although you will need a special cable to connect the two. Once connected, you merely type a simple command to transfer the program from tape to computer.

DISK DRIVE. The transfer method is much the same with a disk drive, except that the program is stored on a floppy disk, which looks much like a 45 rpm record.

The disk drive enters programs much more quickly and with less chance of error than the cassette re-

corder. But the cassette recorder is significantly cheaper.

CARTRIDGE. A cartridge, which plugs into a slot built into some computers, also stores programs. Putting a cartridge into a computer actually adds memory to the computer—and that memory contains a program.

Processing. All input goes to the Central Processing Unit (CPU), located underneath the keyboard. The CPU is a maze of tiny electronic circuits, but it functions as a giant.

The CPU controls the flow of information into, out of, and inside the computer. The computer's memory, where information is stored, is located in the CPU. The CPU also interprets a program, performs each of its steps, and then sends the results to the user.

Output. The visible result of a CPU's work is called output. Output is made available on the screen of a TV or monitor, or from a printer.

Computers can be hooked to TVs or monitors, and to printers. In all cases special cables are required. In general, the monitor's screen display is sharper than the TV's.

Storage. When the computer is turned on, it will store and remember all information it receives. But when it is turned off, this information will vanish—unless you instruct the computer to save it.

You can store information on a blank tape or disk. Either way, you can record the results of the computer's work, just as you would record a speech. Then, any time you want to run that program again, you can transfer it into the computer's memory, and see it on the display screen.

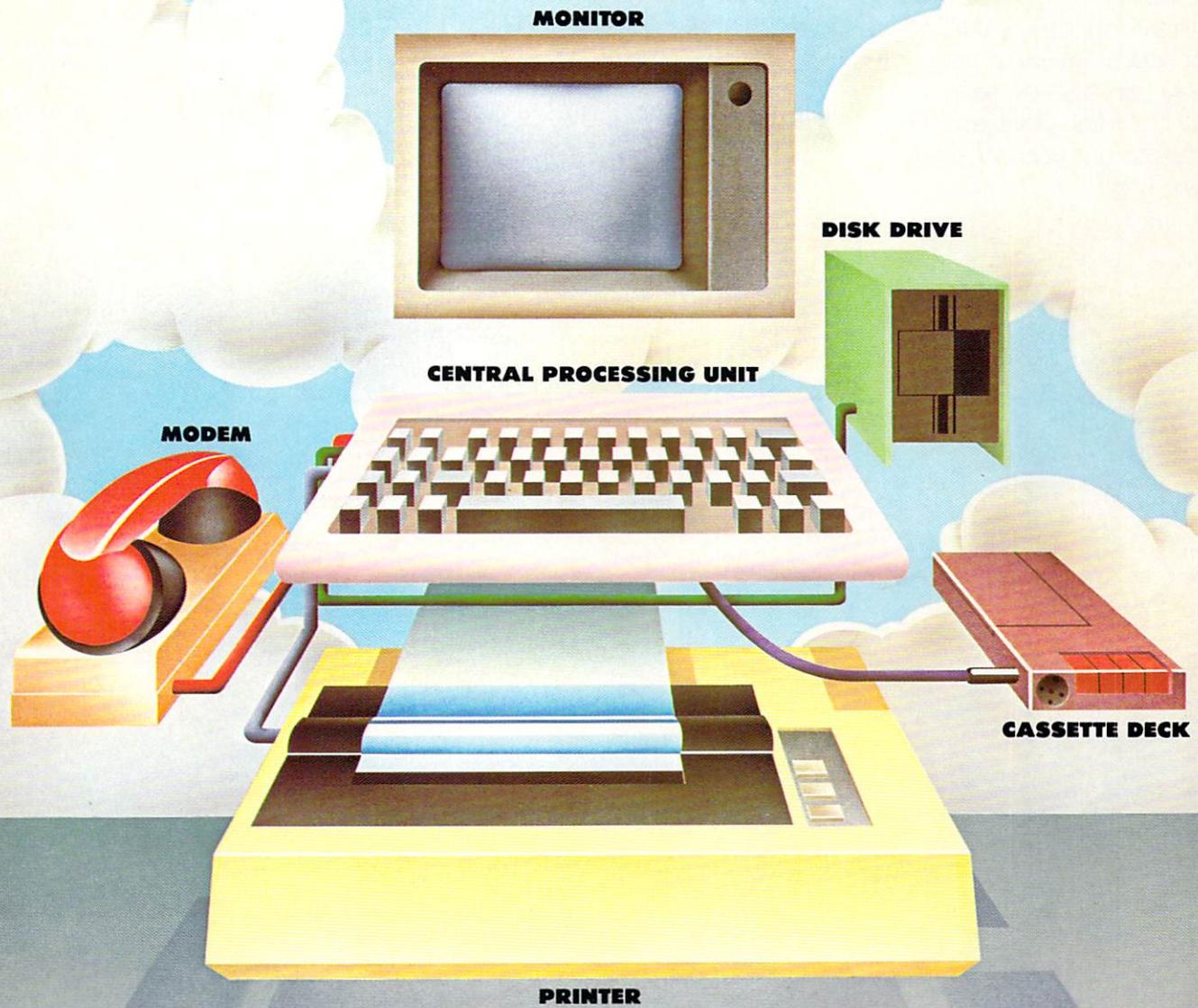
You cannot store new information on a cartridge.

Peripherals. Peripherals are optional pieces of equipment that can be added to your computer, but are not crucial to the computer's operation. A printer, in fact, is considered a peripheral. One of the most popular peripherals is a modem.

MODEM. If you want to link your computer to an information service or other computers, you will need a modem. A modem holds a telephone receiver and transmits and receives data through phone lines.

Remember that the computer is a tool. As with all tools and machines, there is no need to know everything about how a computer works. All you need to know is how to use it for your own purposes.

THE COMPONENTS



THE PRIMER THE SETTING

It takes care to shop for a computer. It takes still more care to set it up properly. Reading the directions thoroughly is important. So is common sense. Today's personal computers may be sturdy machines, designed for many hours of use, but they can also be sensitive and finicky. Here are six steps to get you off and running.

1. Setting Up

When you open the box, check the manufacturer's packing list (or manual) to make sure you have all the parts. If you don't, call the store immediately.

Set the computer in an area that won't get a lot of traffic. And keep in mind that the computer will function best at normal room temperature. In unusually cool or damp rooms, such as an unheated basement, the computer will need some time to warm up.

Keep the surface around the computer clear, so the machine can get good air circulation when working. Even those machines that have inte-

rior fans need air movement to keep from overheating.

As with a TV, position the monitor away from sunlight glare, which can cause eyestrain. And, if you have a printer, try to place it on a separate table, so that its vibrations don't jiggle the computer.

2. Beware of Static

If the computer room has a rug, beware of static electricity. Small doses of static can cause the computer to speak gibberish; large doses may cause real damage. Static electricity is most likely to build up in winter months, when rooms are hot



THE PRIMER SHOPPING DOs AND DON'Ts

and dry, but it's easy to combat—just spray the rug with a mild mixture of fabric softener (such as Downy or Stay-Puf) and water. If the static recurs frequently, you may need a humidifier or static mat.

3. Plugging In

Buy a power strip, available from most hardware stores for around \$20, to eliminate the massive tangle of cords and wires from your computer, video monitor, disk drive or tape deck, and other peripherals. You don't want small children or pets to bring the whole system crashing to the floor. And don't plug heavy appliances into the same outlet as the computer. When turned on they will cause a sudden drop in voltage, which may play havoc with the computer.

4. No Food or Drinks Allowed

Do not eat or drink near the computer and its accessories. Foreign substances, including spills, dust, and smoke, can destroy programs on cassettes and disks—and they will slowly wear down the computer, cassette player, or disk drive.

5. Safekeeping

To protect programs, keep all cassettes, cartridges, or disks in tightly closed boxes out of reach of small children and pets. The boxes should not be near magnets or magnetized tools, which may erase programs. Disks are especially sensitive (more so than records), and can be ruined by a thumb print. Treat them gingerly, as if they had a "Wet Paint" sign on them. Valuable programs should be copied and stored elsewhere, as a form of insurance. The owner's manual will explain the copying process.

6. Read Before You Leap

Before using the computer, read the manual carefully. Even though you can't do the computer much harm by experimenting with the keyboard, you will save some initial frustration by memorizing basic instructions. It may pay to copy these instructions and tape them on the wall in front of you. In any event, keep the manual nearby, preferably on a shelf with your programs.

Don't worry about the whirring or clicking sounds the computer makes when storing or retrieving data. These are, after all, just the sounds of a machine with a giant memory at work.

Shopping for a computer is unlike any experience most of us have ever had. It's unnerving even to those who previously found shopping a form of recreation. In addition to the fact that most of us feel dumb and vulnerable when we walk into a computer store for the first several times, there's the fact that we are. Most first-time buyers know very little—even about why they want a computer. Few know much about the technology, its applications, or the specific products available. Many salespeople know little more.

There are a number of specific steps that will increase the comfort level in this tension-producing situation. Here are 10 shopping guidelines:

1. Figure out who in the family will use the computer, and for what purposes. When you shop, take along your list of these objectives and measure the computers you see against them. Take brochures home to read in your favorite chair.

2. Many experts say that after you decide why you want a computer, find out which software is best to accomplish that task and then find the hardware it fits. Don't start the other way around, they advise. Sometimes shoppers get so caught up with the equipment, they don't pay enough attention to the software. But the greatest computer in the world is not much use without the software you want.

3. Ask plenty of questions. Ask the same questions of different people. Then ask more questions. Don't be afraid of appearing "stupid," because there's no reason you should know anything about computers. Make sure you get answers you understand. Don't be intimidated by jargon. The person using it may not know much more than you do. To meet people who are using the computers you are considering, attend a local user-group meeting.

4. Be sure you know what you're getting for the money. You need more than just the keyboard unit, which is what most advertising refers to. You also need a cassette recorder or disk drive to run programs, and a monitor or TV to see what's going on. And, if you want copies of your work, you'll need a

printer. Many of these add-ons cost more than the keyboard unit itself. If you're buying peripherals, ask about what you need to hook them up and get them working. There are lots of extra costs, and not all salespeople volunteer this information.

5. Demand a demonstration, and try out any computer you're thinking of buying. Finding a comfortable keyboard is important—pretend you're testing a new car.

6. Read magazines to see where the industry—and any computer you're considering—is heading. You want to make sure you'll have an array of software and equipment to choose from in the future. In this regard, be wary of promises made by manufacturers or retailers about forthcoming products. They can take months to materialize; and the promises often vanish into thin air.

7. Discounts are great, but there's no such thing as a "free lunch." Though you pay more when buying from a certified dealer, you generally get better service. If you're buying from a department store or through mail order, find out where you have to take or send the computer for repair. Sending a computer to Timbuktu is no bargain.

8. Don't rush things. Take the time to comparison shop. As you learn more, your ideas about what you want will probably change.

9. One addendum to the last point. Don't wait for a state-of-the-art machine, unless you prefer twiddling your thumbs to exercising them on a keyboard. There are any number of reasonably priced computers on the market that will keep you and your family entertained and challenged for several years.

10. If you're having trouble finding a computer that satisfies the needs of everyone in your family, consider this option: Buy a low-end start-up computer for the children (or put their allowances toward it) and another more sophisticated computer that suits you. This is better, and not much more expensive, than buying a "compromise" computer that satisfies no one.

How to get in touch

KoalaPad™ Touch Tablet
puts the controls
at your
fingertips.

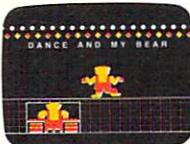


Paint the screen with colorful graphics or play lightning-fast games with just a touch of your finger. The KoalaPad™ Touch Tablet makes using your computer more fun than ever before. Just moving your finger across the special touch-sensitive surface controls graphics, game commands, and much more. It's a great way to get the most out of your computer while you just sit back and

with your computer.

relax. The KoalaPad fits comfortably in the palm of your hand for easy use. And once you have it in

Dancing Bear™ brings a funny, furry cabaret star right into your home where your own programmed performances will win applause every time.



your hands, it's hard to put down. That's because the KoalaPad does much more than joysticks, paddle controllers or the "mouse." Each KoalaPad set is packaged with a KoalaWare™ graphics program* for creating beautiful, high-resolution graphics right on the screen. And that's just the beginning.



Spider Eater™ the game that attacks musical education with a voracious appetite, taking a bite out of the task of learning the musical scale.



There's a full line of KoalaWare programs to choose from with a perfect

Logo Design Master™ uses computerized graphic design to help children and adults learn the basics of programming and prepare for more advanced applications.

combination of entertainment and education.



Spellicopter™ takes off into the world of spelling with aerial acrobatics to challenge young students.

Add a touch of excitement today to your Apple®, Atari®, Commodore® or IBM® computer.

See the KoalaPad

Touch Tablet at the computer store nearest you. To locate the dealer in your area, call toll free 800-227-6703. (In California, 800-632-7979.)

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We make computing more personal.™



*Software included with Touch Tablet varies with computer type.

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Koala Technologies Corporation,
3100 Patrick Henry Drive,
Santa Clara, Ca. 95050

THE PRIMER

THE WORDS

The Words is a glossary of commonly used computer terms. Some are well-known English words, such as *read* and *write*, that have been incorporated into computer language and given different meanings. (Note: All italicized words in the definitions are defined in full elsewhere in the glossary.) Other terms that refer to a computer's inner workings are not often used in common speech, but are important because they are used in manufacturers' specifications and ads. Don't be awed by them. Remember the delight with which Americans took to the new NASA language over 20 years ago, when John Glenn first orbited the globe.

Access

To retrieve information from a storage place in the computer system. Access time is the amount of time it takes to obtain the information.

Address

A specific location in the computer's *memory* where a piece of information is stored. Each address is identified by a number.

Applications software

Programs that instruct the computer to perform one task or a group of related tasks, such as keeping track of a household budget, or the accounting and inventory of a business.

BASIC

Beginner's All-purpose Symbolic Instruction Code. A popular, easy-to-learn *programming language* widely used with *microcomputers*.

Baud

Bits per second. A unit of measurement that describes the rate at which *data* are transmitted from one device to another, such as computer to *printer*, computer to computer, or computer to *terminal*.

Binary code

A number system using only two digits, "0" and "1." Any number or letter can be expressed as a combination of these digits. Computers use the system by translating each *character* of information into a string of binary numbers.

Bit

The smallest unit of information a computer uses. A bit is either the digit "0" or "1." An "eight bit" processor manipulates *data* in clusters of eight bits.

Board

Printed circuit board. A flat, thin rectangular component of a computer that includes one or more layers of printed circuitry and to which *chips* and other electronic parts are attached. As an add-on to an existing computer, sometimes called a card.

Boot

Derived from "bootstrap." To start or restart a computer system by *reading* instructions from a storage device into the computer's *memory*.

Bug

An error in the logic of a computer *program* that prevents it from running properly. Bugs can cause a program to "freeze up," that is, to repeat the same operation endlessly. Finding and correcting the error is called debugging.

Bus

A device that connects components of a computer so that *data* can flow between them. There are several conventional buses that allow components made by different manufacturers to be used in the same computer.

Byte

One byte contains eight bits, enough to stand for one *character* of English, or one number. Thus, it generally takes more than one byte to make up a word. "Cat," for instance, requires three bytes.

CAI

Computer Assisted Instruction. A term applied to a wide range of instructional *software*, including drill-and-practice, simulation, and educational games.

Cartridge

A device that stores a pre-recorded *program*. A cartridge is inserted into a special slot built into the computer. Also known as a solid state cartridge or *ROM* module.

Cassette tape recorder

Computer cassette recorders are usually the same as those used for audio recordings, but often need a special cable to connect them to the computer. They house and run magnetic tapes that either hold a prerecorded *program* or store *data* from the computer.

Character

A letter, number, or symbol.

Chip

A small (about the size of a child's fingernail) component that contains a large amount of electronic circuitry. Chips are the building blocks of a computer and perform various functions, such as doing arithmetic, serving as the computer's *memory*, or controlling other chips.

Command

An instruction that tells the computer to do something, such as to run a *program*.

Compatibility

The ability of different devices, such as a computer and a *printer*, to work together; or the ability of a particular *program* to run on a given computer. In short, the ability of anything in a computer system to work with anything else.

CP/M

Control Program for Microprocessors. A widely used *operating system* for microcomputers.

CPU

Central Processing Unit. The "heart" of a *microprocessor*, with components that control the interpretation and execution of instructions.

CRT

Cathode Ray Tube. A TV or TV-like *monitor* used to display information and pictures. Also called a computer screen.

Cursor

A symbol, usually a small square, that indicates where the next *character* will appear on the CRT screen.

Data

Information put into or taken out of a computer.

Data bank

A central location for storing vast amounts of information accessible by computer.

Data-base manager

A *program* that allows the user to enter, organize, sort, and retrieve information.

Disk

A magnetic device for storing information and *programs* accessible by a computer. A disk can be either a rigid platter (hard disk) or a sheet of flexible plastic (floppy diskette). Disks have tracks, much like grooves on LP records, where *data* is stored.

Disk drive

A device that *reads* information from a *disk* and copies it into the computer's *memory* so that it can be used by the computer, and that *writes* information from the computer's *memory* onto a *disk* so that it can be stored.

Documentation

The written instructions that explain how to use computer *hardware* or *software*. Also refers to all instructions and remarks, used to describe procedures when programming.

DOS

Disk Operating System. See *operating system*.

Downtime

Time when a computer is not working.

Electronic mail

The transmission of messages, documents, or other information from one computer user to another. This can be done over telephone lines using devices called *modems*.

Emulator

A *hardware/software* device designed to translate *programs* written for one particular computer so that they will run on another computer.

Firmware

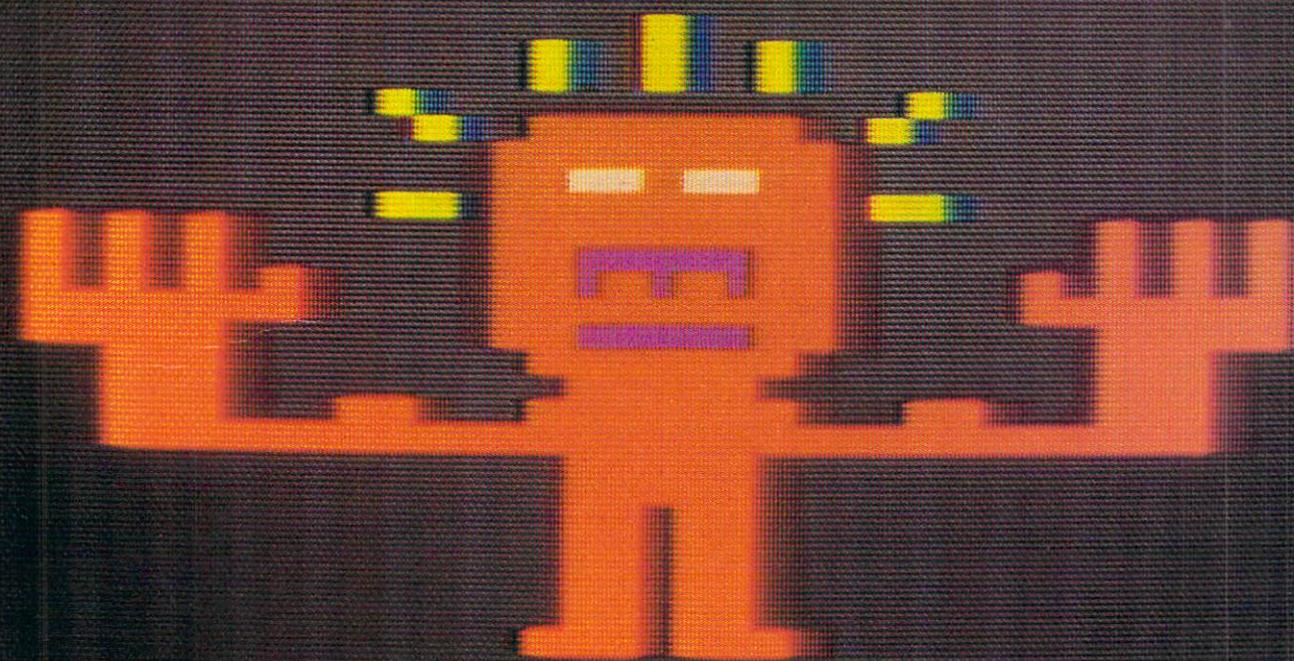
Programs or *data* stored in *ROM*—either built-in by the manufacturer, or added with a cartridge—that cannot be changed by the user.

Flow chart

A diagram on paper that shows all the logical steps necessary to write a *program*.

Format

To prepare a *disk* so that it can receive and store information. Until you perform this task, the *disk* will not be able



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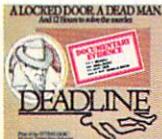
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THE PRIMER

THE WORDS

to store any information. The word "initialize" is often used to mean the same thing as format.

Function key

A special key on the computer's *keyboard* that has been or can be designated to perform a specific task.

Graphics

Pictorial displays on the *CRT*, such as charts, graphs, and symbols. Contrasted with *text*.

Graphics tablet

A kind of electronic drawing board. With a graphics tablet and a special pen, whatever you draw will appear simultaneously on the *CRT*.

Hard copy

Information printed by the computer onto paper.

Hardware

The physical, nonchanging parts of a computer system. Contrasted with *software*, or *programs*, which can change.

High-level language

A *programming language* that resembles an ordinary spoken language (e.g., English).

BASIC is a high-level language.

Information services

Broad-based *data bases* that offer a variety of services, ranging from airline reservation information to stock market quotations. You need a *modem* to link up with such a service.

Input

Programs or *data* entered into the computer.

Interface

An electronic connector between the computer and its *peripherals*.

K

Abbreviation for kilo, or 1,000. When used to describe the amount of *memory*, or storage space, a computer has, it often signifies 1,024. A computer with 16K *bytes of memory*, for example, can store 16,384 *characters* of information.

Keyboard

Designed much like that of a standard typewriter, the keyboard is used to enter information into the computer.

Load

To enter a *program* from an external storage device into the computer.

LOGO

A *programming language* that allows the user to draw pictures on the screen. LOGO is particularly good for teaching young children how to *program*.

Loop

A statement in a *program* that instructs the computer to repeat a certain task.

Machine language

A binary code consisting of "0"s and "1"s, which is the only language a computer understands. *Programs* written in any other language, such as *BASIC*, are translated into machine language for processing.

Membrane

A type of computer *keyboard* with a flat, smooth surface.

Memory

The place in a computer where *data* and *programs* are stored.

Menu

A list on a *CRT* of the operational options of a computer *program*; a list of programs stored on a *tape* or *disk*.

Microcomputer

A small computer designed primarily for home or small business use. The micro can do today what many room-sized mainframe computers did 20 years ago.

Microprocessor

A tiny processor on a single *chip*. The "brains" of all *microcomputers*, it is also found in many consumer and industrial products.

Modem

A contraction of Modulator/De-modulator. A device that makes it possible to transmit and receive computer *data* over telephone lines.

Monitor

A device for visually displaying a computer *program* or the results of that program on a screen. See *CRT*.

Network

A system of linking computers so that users can share resources and exchange information.

Operating system

A *program* that controls the operation of a computer system, such as controlling signals to the *disk drive* or *printer*. When a computer system is turned on, the operating system is the first program executed. All subsequent pro-

grams are loaded and supervised by the operating system.

Output

Computer-generated information that is transferred to a *monitor*, *disk*, tape, or *printer*.

PASCAL

A *programming language* that can be used on many *microcomputers*. While it is considered more difficult to learn than *BASIC*, it can generate *programs* that run faster and use less *memory*.

Peripherals

Hardware accessories for a computer, such as a *disk drive*, *printer*, or *modem*.

Pixel

Stands for "picture element." A single dot of light on a TV screen or computer monitor. These tiny elements are used to create electronic pictures, or *graphics*.

Plotter

A machine, attached to a computer, that prints lines or graphs on paper.

Printer

A machine that transfers information stored in the computer onto paper. Two of the most commonly used printers are: dot matrix—a printer that forms *text* or *graphics* using a group of individual points (dots); and letter quality—a printer that prints fully formed characters (like a typewriter), using a type element called a "daisy wheel."

Program

A set of step-by-step instructions that tells a computer how to solve a given problem. Also, to prepare such a set of instructions.

Programming language

A language, with clearly defined rules, that can be used to express a computer *program*.

RAM

Random Access Memory. An area in the computer where information is stored. When called into this area, information can be *read*, changed, or edited. However, it will be lost when the computer's power is turned off, unless you first *save* the information.

Read

The process of copying information from a storage device (such as floppy disk or tape) into the computer's *memory*.

Reading only copies; it does not erase the *data* from where it is stored.

Resolution

The sharpness of a picture on a *CRT*, usually described as "high" or "low." The higher the resolution, the sharper the picture. Resolution is expressed by the number of *pixels* in the display. For example, 560x720 is much sharper than 275x400.

ROM

Read Only Memory. Permanent *memory* built into a computer by a manufacturer. The information stored here gives the computer operating instructions when it is first turned on. The user cannot change this memory, but "only read" it.

Save

To store information from *memory* on tape or *disk* so that it can be used again.

Software

Computer *programs*. Also, tapes and disks.

Stringy floppy

A computer storage device that holds a magnetic tape, called a wafer. The enclosed wafer tape is thinner, narrower, and faster than conventional cassette tapes.

Terminal

A computer user's workstation. Also refers to the computer screen where information is displayed.

Text

Words, letters, and numbers that appear on a *CRT*. Contrasted with *graphics*, which are lines, shapes, and symbols.

Winchester

A type of hard disk that is sealed in an air-tight, dust-free container. See *disk*.

Word processor

A *program* that allows the user to write, edit, or rewrite *text*. The *text* can be saved on a storage device and printed out. A word processor allows the user to make changes in the same *text* without retyping the whole page.

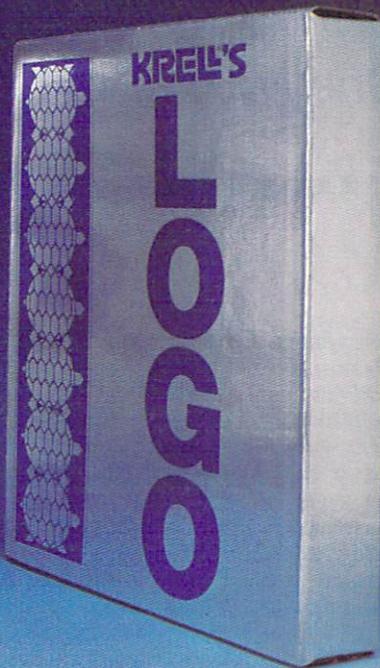
Write

The opposite of *read*. To transfer information from the computer's *memory* to a storage device such as a floppy disk. Write-protect is a procedure for preventing a disk from being written to.

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SIGN OFF

OF PIRATES AND PRINCIPLES

One Mother in Dogged Pursuit of Copycats

BY KAREN GROSECLOSE

Last spring, my children asked permission to hold a get-together in our home for users of the local computer bulletin board. These meetings are great ways for people to convene and chat with system operators, leave messages for other users, and discuss various kinds of software and hardware. About 20 people expressed interest, promising to bring along snacks, drinks, and computers of all kinds. But when my 13-year-old son John left word on the bulletin board that his mom would not allow any software pirating during the party, people began to back out. When only six people showed up, John was crushed.

Afterwards, John's friends teased him—he was a "sissy" whose mom wouldn't let him (or anyone in her home) duplicate copyrighted software. Some kids won't even visit our house anymore. They don't want "Mother Groseclose" watching over them. But I can't condone software piracy—which is, after all, a form of theft—without condoning other forms of theft, too.

"But everyone does it. It must be all right!"—a comment I often hear. Even people who can afford to buy software seem to be proud of their pirating capabilities. But when it comes right down to it, the duplication of copyrighted, licensed, or agreement-bound software is illegal. It's even questionable as to whether or not you can loan copyrighted software to a friend, as you would pass on a good book. Most licensed software is supposed to be used only in the machine of the purchaser.

A Game Without Winners

Some compare software piracy to a game. But in this game, there are no winners. Not the software manufacturers, who have to raise prices in

KAREN GROSECLOSE is a data-processing consultant and mother of three in Arizona. In her spare time, she enjoys helping other families get started with personal computing.

order to compensate for revenues lost to all the illegally obtained programs floating around. Not the consumers, like you and me, who have to pay those higher prices. Not those of us who want to alter programs to fit our needs more directly, but can't because of the elaborate copy-protecting measures programmers take. Not even the "pirates" themselves, who can't get important documentation or manufacturer support without a registered copy of the product.

Sure, it's much easier to go along with this game. Certainly it's cheaper. But when asked the question, "Is it stealing?" one must admit that, by definition, the answer is "Yes."

One of my children's friends came to our home one day with an unlabeled disk and began to show my kids his new games. He said that a friend of his father lends them "backup copies" of new games. (Purchasers of new software often make backup copies in case something happens to the original.) When I suggested that his games were pirated, and hence stolen property, the boy replied, "It can't be stolen; my father gave it to me!" On his next visit he announced he had discussed the issue with his father and had

erased all their pirated copies.

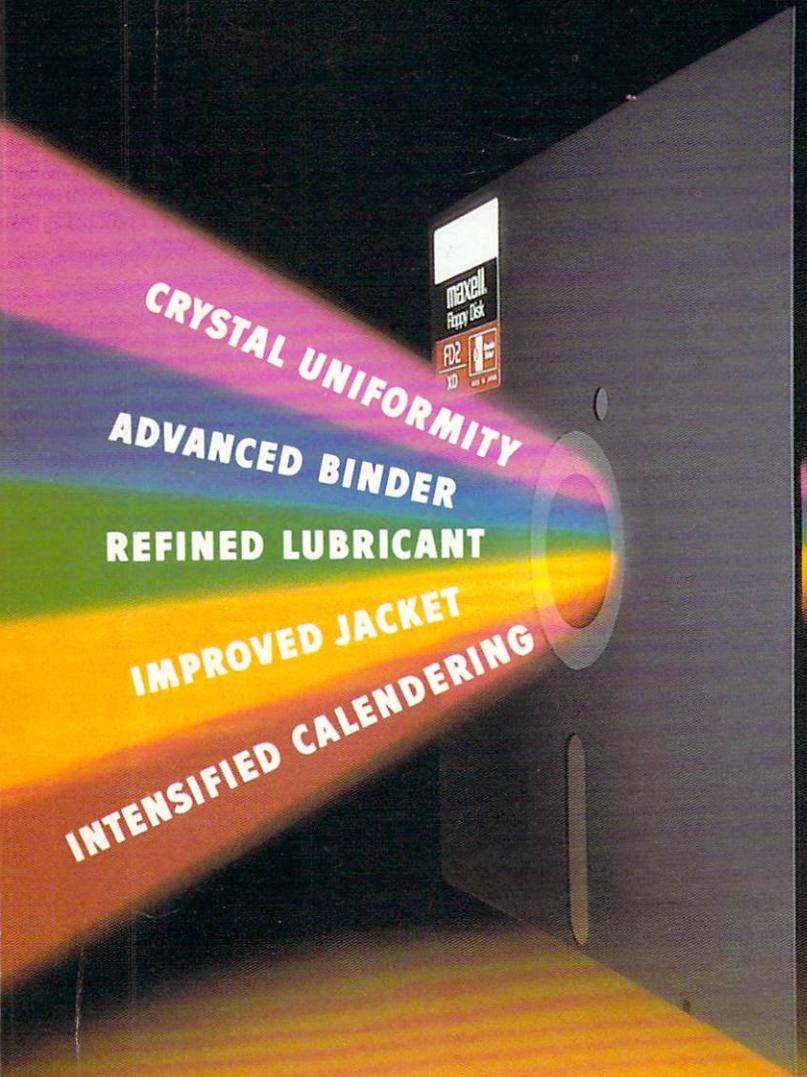
Questions and occasional resentful comments from my kids continue, as do insults from friends and fellow bulletin-board users. But my position won't change. Our decision to get into family computing involved budgeting, not only for hardware but for software purchases, too.

Alternatives to Piracy

There are alternatives to pirating software. One is to find good public-domain software (software that the author has donated to the public for free use). Such programs are available from many sources: computer clubs, magazines, books, and libraries. All it takes is a little time and persistence to find programs for everything from business applications to games. They may not be as fancy as the flashiest new items on the market, but at least they will have been honestly obtained.

I guess my stand on software piracy makes life a little tough on my children, but by now they understand where I'm coming from. It's hard to have a reputation as a prude. But it's even harder to raise kids if you don't have some basic rules. 

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